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Investigating the Effectiveness of Flipped Classroom in Designing and Teaching English for Oil Drilling Course at Kasdi Merbah University- Ouargla

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Title

Investigating the Effectiveness of Flipped Classroom in Designing and Teaching English for Oil Drilling Course at Kasdi Merbah University- Ouargla

Submitted by

Fatima BOUKERSOUL

Statement of Authorship

I hereby declare that the present work entitled “Investigating the Effectiveness of Flipped Classroom in Designing and Teaching English for Oil Drilling Course at Kasdi Merbah University” and supervised by Dr. Farida SADOUNE is entirely my original work. This thesis represents the findings of my own investigation, and I have fully acknowledged all the sources which I used without any appeal to plagiarism. I affirm that this work has not been previously submitted for any degree, diploma, or institution.

Date: 21/10/2024

Signature:

Boukersoul

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Dedication

To my dearest parents ‘Hamid and Mliha’, for their unwavering care and boundless nurturing love that has profoundly shaped who I am today.

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List of Acronyms

AI: Artificial Intelligence

ATs: Assessment Tasks

BE: Business English

BELF: Business English as a Lingua Franca

CA: Constructive Alignment

CAI: Computer-Aided Instruction

CELL: Computer-Enhanced Language Learning

EAP: English for Academic Purposes

EBE: English for Business and Economics

EFL: English as a Foreign Language

ELF: English as a Lingua Franca

ELT: English Language Teaching

EMI: English Medium Instruction

EGAP: English for General Academic Purposes

EGP: English for General Purposes

EOP: English for Occupational Purposes

ESP: English for Specific Purposes

EST: English for Science and Technology

FC: Flipped Classroom

FCM: Flipped Classroom Model

ICT: Information and Communication Technology

L1: First Language

L2: Second Language

LMS: Learning Management System

MOOC: Massive Open Online Course

NA: Needs Analysis

NLE: New Learning Environments

PLATO: Programmed Logic for Automated Teaching Operations

SFL: Systemic Functional Linguistics

SFG: Systemic Functional Grammar

SOLO: Structure of the Observed Learning Outcomes

STEM: Science, Technology, Engineering, and Mathematics

TALL: Technology-Assisted Language Learning

TELL: Technology-Enhanced Language Learning

ZPD: Zone of Proximal Development

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Introduction

In recent years, the world is becoming more interconnected due to technology spread and use. This situation motivates academicians to recognize the importance of technology integration in educational institutions. Thus, the landscape of education has witnessed a great transformation due to the impact of those technological innovations. The latter have influenced the way the instructional content is delivered and redefines the conventional pedagogical roles of teachers and learners. Additionally, they serve as a means to support different learning styles and needs in the English for Specific Puroses classes.

The flipped classroom model (FCM) is an instructional approach that is based on the use of modern technologies. It has emerged as a significant development to address the challenges caused by the traditional teaching dynamics. This model reverses the conventional roles of class work and homework. Students engage with instructional digital materials outside of class time and get prepared to participate in hands-on activities during class. Consequently, this teaching model intends at fostering autonomous, interactive and collaborative learning. This approach is particularly beneficial for English for Specific Purposes (ESP) learners due to its focus on enhancing students' proficiency in academic English through interactive and authentic contexts. Besides, both approaches, ESP and FCM, are primarily directed to university students as adult learners.

The present thesis adopts the flipped classroom approach, implements it and tests its effectiveness in ESP classes. Throughout the course of the current study, an attempt is made to present a general overview of ESP teaching in the Algerian higher education context, mainly after the new governmental decrees supporting the status of English language at the expence of French language. In addition, this research tries to investigate the possibility of improving ESP teaching and learning through the integration of innovative teaching methods.

Therefore, it is based on developing a course following the guidelines of the flipped classroom, and then, conveying it for Master-1 Oil Drilling students at Kasdi Merbah Ouargla University.

Background of the Study

The significance of Ouargla University lies in the unique factors that set it apart from other Algerian institutions. The region of Ouargla is known for its richness in natural energy resources and petroleum fields. Oil and gas companies in this Saharan area are either multinational or from western countries signing contracts with Algeria to work there. They employ a particular number of workers mastering certain workplace skills. To set equilibrium in human resources management and avoid workplace domination, they hire a specified percentage of local residents. Opportunities are offered for local residents who master English besides the required professional skills to be appointed there. This procedure aims to maximize work efficiency and reduce costs of overseas workers.

Being equipped with international techniques and skills in the hydrocarbons field as well as having sufficient English proficiency level lowers the costs and higher salaries of overseas workers. Additionally, this procedure helps at gradually replacing foreign workers with local qualified ones along with reducing unemployment. These demands have been raised by the local residents for many years. In other words, being well-trained and having enough mastery of English will increase the local inhabitants' job opportunities, work productivity together with the needed self-confidence for effective communication in oil companies.

To make a long story short, these criteria create a great motivation for the students at Ouargla University to be competitive in the marketplace for better job opportunities. The problem arises from whether hydrocarbon students are ready for such future careers or not. One of the aims of this research is then to evaluate their formal university courses and their

efficiency for a better mastery of academic English, specialized terminology of oil industry, and business communication forms needed for use in real-world occupational settings.

In the faculty of Hydrocarbons at Kasdi Merbah University- Pole 3, lectures are generally presented in English mainly because Algeria has adopted English as the first foreign language in 2022 and as a medium of instruction in 2023. However, the ESP courses have not been redesigned yet to meet the new teaching trends. The classes of English are taught for one semester for Master-1 students. Many of the students of this department are expected to end up working in the English environment of oil companies.

Opting for higher education for the current study is due to many reasons. Barnett (1990) argues that "an educational process can be termed higher education when the student is carried on to levels of reasoning which make possible critical reflection on his or her experiences, whether consisting of propositional knowledge or of knowledge through action" (p 202, as cited in Boulton-Lewis, 1995, p. 143). In the same reference, this researcher considers that the reasoning and reflection levels are 'higher' as they develop the students' expansive outlook and deeper comprehension of the acquired material.

Boulton-Lewis (1995) state that "the belief about higher education … is that it should lead to higher order thinking for most graduates" (p. 143). He clarifies that higher education aims to supply students with a comprehensive understanding of the subject matter and framework within their selected disciplines, equipping them to effectively apply this knowledge in the pursuit of further scholarly growth and in practical and professional settings. They provide evidence that students may obtain information from lectures and texts and demonstrate routine application, but genuine understanding and critical thinking may not necessarily be achieved. This outcome can be attributed to factors such as students' limited knowledge of effective learning and motivation, as well as lecturers' understanding of learning, expectations, instructional strategies, and course organization.

The present era of the technological growth has revolutionized all domains including economy, society, business, science, education, etc. It provides quick access to knowledge and information via connecting to internet through numerous technology tools such as laptops, computers, and Smartphones (Fu, 2013) along with a variety of software (Hindle et al., 2016).

Now more than ever before, students spend much of their time using several types of technology tools. This makes it possible for them to interact with friends, instructors, and learn not only within the class walls, but also outside the class through distance education (Simonson et al., 2019). In addition, a plenty of free learning materials and activities are available on different websites. Richter and McPherson (2012) argue that today's digital age enables students to get free access to online learning resources including video lectures. Moreover, internet-based learning facilitates cooperative learning, promotes students autonomy, increases their motivation, offers relevant opportunities for practising language skills and knowledge, and makes learning experience more student-centered (Ahmadi, 2018). As a consequence, traditional teaching approaches centralizing the instructor's role becomes irrelevant in modern digital era (Wang & Heffernan, 2010).

Drawing on the earlier points, an urgent need to adapt to the situation created by technological advancement has emerged. Teachers seek new ways to enrich their course content and extend learning beyond the school walls and its scheduled timetables (Watson, 2008). To that end, traditional activities such as lectures, labs, homework, and exams need to be enhanced through incorporating modern technologies in education, enabling students to learn everywhere outside the classroom (Staker & Horn, 2012). Classroom time is devoted for discussions, analysis and thinking critically to actively solve problems presented by activities, instead of passive recipient learning in the traditional teacher-dominated lecturing educational environments (Ahmadi, 2018).

English has emerged as an international language and lingua franca. New technologies have been developed and used in English classes. As for their advantages in learning English, Huseinović (2024) states that technologies increase access to resources through mobile apps, learning platforms, and websites, engage learners in interactive content, involve them in communicative situations with their counterparts around the world and equip individuals with the necessary 21st-century skills such as critical thinking and collaboration.

In this globalized world, it becomes of great significance to learners to develop their English communicative proficiency and technological skills. Mastering these skills plays important role in creating real connections between people worldwide and opens up diverse employment opportunities. It can offer people access to more opportunities in academia and in the workforce.

Interestingly, learning English is no more considered as an end in itself, but rather a means to fulfill specific needs and expectations. Consequently, new trends and different approaches have been applied to evaluate the learners' needs, consider their wants and address their lacks in order to develop their language skills for their academic (English for Academic Purposes) or occupational purposes (English for Occupational Purposes). Accordingly, English for specific purposes (ESP) has emerged as a branch in language teaching.

ESP teachers are interested in improving the effectiveness of their courses and enhance students' active and autonomous engagement in learning meeting their needs. To achieve this, new tech-based teaching approaches have been applied in conveying ESP instruction. An instance in this context is the flipped classroom which recently stands out as a new model of blended learning which is defined by Graham as system that combine face-to-face and digital instructions (2009). A pertinent instance concerns designing and teaching English for Oil Drilling to Master 1 students at the University of Kasdi Merbah in Ouargla.

It seems concluding that both flipped classrooms and ESP courses appear as a necessary response to the current world developments. The goal is to practice a more student-centered pedagogy, thereby engaging the students in active learning experiences.

Statement of the Problem

The world has witnessed the health crisis of Corona virus which has affected all aspects of life especially education. Since the first emergence of Covid-19 Pandemic in 2019, the lockdown was obligatory in most of the countries and schools, universities and training centers were closed. Consequently, students were not able to attend all the lectures due to the safety precautions and social distancing measures. Face-to-face teaching has become a hard task. Therefore, e-learning has jumped to be in the first rank as an alternative instructional method and has been adopted in many countries.

In Algeria, university students have attended lectures on ZOOM or Google Meet. They have also downloaded their lessons in different formats (e.g. PDFs, PPT presentations). Learning platforms such as Moodle have been used to maintain teacher-student contact and cover the planned curriculum at its scheduled time. Consequently, teachers have been required to deliver their courses online.

This unanticipated transition from traditional or on-campus to distance learning has not only posed such challenges. It has also caused disparity in terms of access to education. This was a radical change in the educational field. Although e-learning was available before 2019, but not as the only existing method of instruction. This situation sheds the light on the challenge of effectively integrating flipped pedagogy as a form of e-learning. This entails putting a well-designed plan for its implementation in ESP classes within Algerian higher education institutions. It also requires monitoring of the practices of Algerian ESP teacher within this modern teaching framework and addressing any challenges encountered during the transition.

Assassi (2021) states that Algerian academicians and professionals need to communicate effectively in English as it becomes vital in conducting reliable research and work performance. According to Khaldi (1995), the university is able to contribute to the development of the use of this language in public and private sectors. This is mutually beneficial for the company and university. The former needs the expertise of the ESP teacher in terms of course design and evaluation. Likewise, the latter maintains contact with the actualities of economic environment in which English is used.

Khaldi (1995) conducts an investigation which was carried out to support Language Service of the Algerian Oil Company 'Sonatrach'. This researcher evaluates the various English courses currently offered by this service. The findings reveal that learners' expectations are rarely met due to insufficient oversight over the schools providing English courses. These schools do not have qualified staff to run them. Additionally, they lack qualified teachers to ensure quality in the delivered courses. Moreover, only few universities all over Algeria are offering ESP courses to their students, arguing that students of English are generally directed to teach in middle and secondary schools after graduation. Therefore, getting specialized in ESP is not considered essential for them. In the same vein, Assassi (2020) confirms that Algerian universities focus on English for General Purposes (EGP) courses rather than ESP. Therefore, the current courses students attend do not serve their needs in professional as well as academic contexts.

ESP practitioners hold more responsibilities than a common language teacher as they act also as course designers, collaborators, researchers and evaluators. For this reason, many scholars and linguists prefer to use the label 'practitioner' instead of 'teacher' to emphasize that ESP course requires more than teaching (Sartorio & Hamitouche, 2021). Belinda Ho (2011) points out that course designers and teachers encounter problems related to the design of the ESP course, the tasks, and assignments and teaching method. ESP teaching demands

well- trained teachers. Unfortunately, the Algerian university context is a case in point. As far as the status of ESP in the Algerian universities is concerned, Boudersa (2018) contends that different perspectives are held towards training to teach ESP. ESP is limited only for the first-degree students in English or entirely frozen as a Master specialty.

This study aims at investigating the following problem: Regardless of whether the teaching of ESP is implemented, restricted or entirely eliminated at Kasdi Merbah Ouargla University, English for Oil Drilling courses are vital in the faculties specialized in oil industry engineering as well as science and technology. In addition, the existing English courses –if any- need to be constantly updated to ensure their relevance and efficiency. Thus, ESP practitioners have to consider innovative methods of teaching that would make ESP courses more authentic, creative and interesting. This initiative intends to maximize learners' active and autonomous engagement in their studies.

Review of Previous Studies

The aim of reviewing the previous studies related to the topic of this research is to provide a background for the study by highlighting key findings, identifying any deficiencies or gaps in the literature, and explaining the way this study contributes to the field. The search for effective teaching approaches is ongoing and is affected by the circumstances of a particular society and era of their emergence (Anderson & Dron, 2011). Language education is no exception through its dynamic response to the incorporation of innovative strategies and technologies, notably with the emergence of English as a globalized language. To enhance the effectiveness of ESP as one type of English Language Teaching (ELT), numerous previous studies have implemented the flipped classroom due to its tech-driven teaching modality.

Delving into the previous literature, the departure will be from the year 2007 with the FC pioneering core principles as a teaching trend developed by Bergmann and Sams . In their book entitled *Flip YOUR classroom: Reach Every Student in Every Class Every Day*

published in 2012, they described in detail the gradual development and application as well as the enhancements on the original model to make it more effective. These researchers explained the method of FC implementation and its fundamental objectives of fostering learning culture. Accordingly, they argue that lifelong learning can be enhanced through assigning students to independently access content at home and then apply that acquired knowledge during class time. Implemented by Bergmann and Sams, FC has evolved to become known as flipped-mastery approach emphasizing the development of self-paced learning outside of class time and deeper understanding among students through practice and discussion of misconceptions during the face-to-face class. The model has been adopted by other educators and a set of challenges have been confronted. The developers of the model suggested solutions to cope with those issues. Instances include the application of the model in different ways depending on their relevance to the context in which it is applied, keeping ongoing assessment techniques, etc.

In the Algerian context, Guessabi (2021) implemented the FC approach at Tahri Muhammed University of Bechar with the aim of addressing any technical and cost-related constraints, among other challenges, facing the target students and teachers related to this model. The findings revealed that the majority of the learners showed inclination towards traditional handouts over technology as well as a resistance to the flipped classroom model. These attitudes stemmed from participants' doubts about the effectiveness of recorded lectures and their probable contribution in increasing absenteeism and lack of engagement. Yet, there was a relative acknowledgement of this modality potential benefit for those unable to attend in-person sessions.

The study conducted by Larbi and Zitouni (2021) focuses on evaluating teachers' perceptions of the FCM in English classes in the Algerian higher education. It aimed to identify the opportunities and challenges associated with this innovative approach. The

sample, consisting of 30 English teachers from various Algerian universities, demonstrated positive attitudes towards FC especially with regard to increasing students' engagement. The faced challenges were related to a notable lack of resources, technology-related issues, and inconsistent student motivation. The researchers recommended providing adequate training and resources to get the fullest advantage from FCM.

A more recent study carried out by Rahmani and Zitouni, (2022) investigated the efficacy of the flipped classroom model in Algerian foreign language classes in the aftermath of Covid-19. They focused on FC ability at enhancing students' engagement and self-directed learning. Interestingly, the findings revealed a significant effect on promoting high-quality learning, enhancing student engagement and inspiring critical thinking skills. As far as the challenges for applying FC, the researchers identified a number of issues such as limited internet access, availability of technological devices, psychological factors like participation anxiety, lack of engagement, as well as the unfamiliarity of teachers with the new teaching approach. To guarantee an efficient transition to the modern teaching trend, they recommended offering a well-designed training for teachers on the implementation of flipped classrooms and enhancing the quality of resources.

The review of previous studies draws attention to an acknowledgement of the benefits of FC at enhancing student engagement and learning. Yet, it also indicates significant challenges which affect negatively its thorough application such as technological limitations, psychological barriers restricting their interaction, inadequate resources and teachers' unfamiliarity with the approach. Studies recommendations for successful flipped classes encompass providing well-designed training for teachers on FC use, enhancing the quality of the instructional content, overcoming the technological obstacles along with creating a supporting learning atmosphere to address the psychological barriers and increase motivation towards its adoption.

Research Gap

Given the limited interest in ESP in the Algerian context, there is a pressing necessity to regularly evaluate English language curricula. This evaluation is important in the science and technology academic disciplines because of the vital significance of English in the globalized world. Accordingly, modernizing its instruction through the integration of new technologies and teaching trends is essential to guarantee students are equipped with the required language and digital skills. Evidence shows an enhancement in English classes in the Algerian context with the implementation of FC, notably increasing engagement and enhancing self-paced and active learning.

Aligning with the underlying principles of 'project enterprise', this would support them successfully navigate any future careers challenges and be to be competitive for better job opportunities. Moreover, there are emerging expectations for faculty administrative and teaching staff to align with the policy of the Algerian Higher Education Ministry of replacing English in the academia with French as medium of instruction.

In this context, this research gap shed the light on the necessity to redesign English for Oil Drilling curricula in response to the policies of project enterprise, taking advantage of the of modern teaching trends, and promoting English as a medium of instruction, ensuring efficient and relevant alignment with the current educational developments.

Research Questions

Through conducting this research, we are trying to answer the following questions:

1) To what extent will FCM prove effectiveness in designing and teaching English for Oil Drilling students at Kasdi Merbah University?
2) What factors should be considered to determine the effectiveness of FCM in enhancing interest of oil drilling students during English sessions?

3) How will the attitudes of oil drilling students and teachers at Kasdi Merbah University be towards FCM?
4) How will FCM address the specific needs and preferences of adult learners?
5) To what extent will the implemented teaching approach align with the 21st century skills among learners?

Research Hypotheses

In the light of the research questions posed above, it is hypothesized that:

1- If both teachers and learners are familiar with technology use, they will hold positive attitudes towards the integration of the FCM in English for Oil Drilling Course.

2- Flipped learning will have a positive impact on English for Oil Drilling Course designing and teaching.

3- By adopting FCM, the designed English for Oil Drilling course will foster 21st century skills in students, preparing them to effectively manage a globalized workplace.

4- FCM will meet the needs of the target students as adult learners, flexibly balancing their academic pursuits with their professional commitments and personal responsibilities.

Significance and Objectives of the Study

The aim of this research is to shed the light on the possibilities and opportunities of effectively implementing the flipped classroom model as a modern teaching approach in the Algerian context. This newly adopted education system comes as a response to the latest health circumstances related to Corona Virus emergence and spread. In addition, the current study comes to cover an important gap in ESP classes created by the current technological

progress to meet the needs of a digital generation of students and teachers, being them digital-natives or digital-immigrants.

To that end, the researcher will introduce her contribution by designing a course for the Master students at Hydrocarbons Department at Ouargla University. This production moves away from the traditional methods of teaching English as a Foreign Language (EFL) and embraces the flipped classroom model as a modern teaching approach. It is intended to be a fruitful contribution in the development of ESP course design and implementation in Algeria.

This research emphasizes the importance of English in the field of oil drilling in Algeria. It seeks to satisfy the needs, wants and lacks of the target population through building a bridge between the university and oil drilling companies, being them Algerian, foreign or multinational. The students' future career necessitates meeting the requirement of the globalized 21st century. Thus, the current thesis works towards developing the quality of English for Oil Drilling courses and facilitating its learning through the adoption of technology-based teaching approaches. The ultimate foundational objective of these innovative trends of instruction in such classes is to enhance students' language proficiency in this academic discipline and equip them with the key skills needed to succeed in different professional environments.

Drawing on the insights of the previous context, conducting this evidence-based research aims:

1) To evaluate the efficiency of implementing FC in the development and delivery of English for oil drilling students at Kasdi Merbah University: The research intends to assess the extent to which this approach improves the target learners' engagement,

motivation and understanding. Implementing FCM entails providing students with lectures and materials, generally online, to be viewed at their own pace during the pre-class time. By doing so, class time is devoted for more interactive and practice of language. Additionally, this model of instruction aims to transform the ESP teacher to a facilitator and guide of the learning process rather than being its center. Therefore, the intended evaluation of the effectiveness of FC will be investigated through gathering data about the extent of applying its principles and meeting its goals.

2) To explore the attitudes towards FCM: The study will analyze the perceptions, attitudes and feedback of the selected oil drilling students and ESP teachers towards their experience with the FCM and its adoption as an official teaching approach in the future. To that end, the data collection tools including interviews and questionnaires will focus on identifying any changes in those attitudes through comparing them in the pre- and post-study phases. In addition, the participants are requested to offer any recommendations for adopting or improving FCM implementation in their fields of study.

3) To align with 21st Century Skills: Another defined objective of the current study is reflected in determining the level to which the applied teaching method contributes in the development of 21st-century skills among learners. This can be traced in learners' reliance on their digital literacy to access the instructional content, employment of their critical thinking skills to solve problems presented in the in-class hands-on activities, engagement in discussions to communicate their perceptions and misconceptions, and collaboratively work with their peers to enhance their learning, etc. All the mentioned elements are included in question format in the questionnaires or items in the classroom observation checklist.

4) To address the target learners' needs as adult individuals: By implementing FCM in oil drilling classes as an ESP session, the research aims to meet the participants' needs as digital natives or digital immigrants. This is investigated in the core foundational concepts of incorporating FCM. First, FCM provides flexible learning which enables the learners to engage with the pre-class English language content at their own pace with respect to their schedules of personal responsibilities and occupational commitments. Second, this model encourages active learning through practical applications during class in collaborating team works and clarification of misconceptions through supportive community members. Additionally, FCM reinforces autonomous learning through providing access to a wide variety of learning resources using diverse digital tools and platforms. Moreover, it enables them to track their progress by facilitating ongoing feedback. To address these FCM principles, research tools notably classroom observation is conducted. This observation entails checking learners' completion of online activities as well as student-student or teacher-student interactions and behaviours during the in-person phase.

Research Methodology

Research Design and Methods

Academic research can be conducted in different ways depending on the field of study and objectives. Kothari (2004) states that "a good design is often characterized by adjectives like flexible, appropriate, efficient, economical and so on" (p. 33). The current thesis will be a mixed research as it will involve a combination of more than one research approach, method and data collection tool.

As for research design, a quasi-experimental paradigm will be employed as random assignment is impossible to be applied in this case. Due to the fact that the target students are studying together in one room during English sessions, forming control and experimental

groups cannot be realized. The quasi-experimental design aims to investigate the existence of any cause-effect relationship between FC as an independent variable and ESP course potential as a dependent one.

However, the field of education often resorts to action research (AR). According to Creswell (2015), action research addresses a specific, practical issue and seeks any probable solutions to cope with it. It is also described as an interactive aproach to data collection that is utilized to explore issues related to teaching, curriculum development and student behaviour in the classroom (Budert-Waltz, 2022,). Accordingly, it provides the possibility of improvement when it comes to the teaching process and practice. Moreover, it offers an opportunity for continued reflection. Therefore, action research is beneficial in the current area of designing an ESP course for the oil drilling students and reflecting on its efficiency. In addition, it represents an attempt to change the teaching method by incorporating flipped classroom model in the Department of Mechanics and Drilling of Oil Fields to meet its ultimate desired outcomes if it proves effective.

The nature of the research dictates the method (Kothari, 2004). So, a mixed-methods approach is selected relying on a blend of quantitative and qualitative data. The quantitative methods are used to provide concrete statistical evidence about the technological equipments presence and use in the target oil drilling classes, to measure the extent of FCM effectiveness as a new teaching approach, to quantify participants' attitudes, opinions, and behaviours towards it and to test the hypothesis of the causality relationship existence between FCM and effective teaching English for Oil Drilling course. To that end, pre- and post-study questionnaires will be conducted amongst the target population.

The qualitative methods are suitable for understanding the meaning of FCM, depicting the events and circumstances taking place during ESP classes once implementing FC course and suggesting any possible improvements for the ESP teachers' practices based on the

findings. Consequently, interviews with English teachers along with classroom observations will be conducted at the target department to understand the impact of the FC intervention on learners' performance. Accordingly, the research will be an exploratory-explanatory action research mixing the features of qualitative and qualitative approaches.

To ensure its validity, peer reviewing by the supervisor and other experts in the field of study will accompany the research conduct in order to guarantee validity and avoid any sort of bias.

Research Tools and Procedures

In the quest of obtaining reliable and relevant data and making the study feasible, pre- and post-study online questionnaires for the students, a face-to-face interview with their ESP teacher and classroom observation of the course interactions and procedures will be conducted. These tools will further help at evaluating the efficiency of implementing FCM to ESP classes.

Setting and Participants

The study will be conducted within the faculty of Hydrocarbons at the University of Kasdi Merbah, exactly in the Department of Mechanics and Drilling of Oil Fields. That is, it is going to occur in the usual physical environment of the research participants to avoid any interference of confounding factors affecting its course. This procedure aims at ensuring a familiar and comfortable surrounding for the target sample's interactions and learning.

Two ESP teachers and thirty-one Master-1 oil drilling students will be involved as participants of the current study. A non-random purposive sampling procedure is used to select oil drilling major students based on their attendance during the regular ESP sessions. At the beginning of questionnaires administration, these subjects are asked to tick 'yes' to grant their consent to anonymously take part as respondents in this study.

Organization of the Thesis

The current research consists of two main parts: theory and practice along with a general introduction and a general conclusion. The first is devoted for reviewing the previous literature and investigating the theoretical background of the main variables of the study. It is presented in three chapters. Chapter One deals with the ESP didactics, Chapter Two is about designing ESP courses and Chapter Three addresses the flipped classroom model as a modern tech-based teaching modality and its implementation in ESP classes.

The second part is rather practical. On its side, it includes the three remaining chapters of the research. Chapter Four is a detailed description of the research methodology and data collection methods used to answer the questions raised earlier. Chapter Five presents the analysis of the collected data across the pre-, during and post- study phases. Chapter Six delves into the discussion of the findings and puts forward the implication, recommendations and main conclusion for the research.

Anticipated Limitations of the Study

Every research has a set of limitations. According to Theofanidis and Fountouki (2019), these limitations represent the uncontrolled factors affecting the perfect conduct of the study. Those potential weaknesses can be associated with the selection and use of data collection and analysis instruments, the report and interpretation of the findings,the selected research design, budget constraints, etc. To that end, it is necessary to understand them in order to overcome or at least reduce their influence on the right conduct of the study.

Two main sets of limitations are presented in two different sections of the current research. The first type –the current section- is purposefully located in the introductory chapter. It discusses the expected challenges for better understanding of the context before delving into the study conduct. The second type will be included in detail in the methodology chapter. It focuses on practical limitations faced by the researcher during the actual execution

of the study. By doing so, the researcher focuses on both the expected and the actual constraints of the research.

The researcher has to explain the internal validity threats which may not be avoided or at least minimized. Needless to say, those limitations may negatively impact the whole study.It is important to clearly present the study limitations to the readers in order to give a transparent explanation of the way these problems or obstacles have influenced the conclusions drawn from the research.

The first problem seems to stem from the chosen research design. Time constraint is a decisive element in the pretest-posttest research. The longest it will be, the highest extent of confounding factors influence will appear. In addition, the long-running action research can lead to the loss or withdrawal of the subjects from the study. Therefore, the time frame is a critical aspect in the current research. In the meanwhile, the short timeframe also will cause problems to the practicality of the research. In this vein, considerations regarding time are to be taken into account.

In addition, the findings comparison will be done between the results of the pretest and the posttest within the same group rather than with a second group or the control group. So, the researchers have to be aware that any differences between the pre- and post-test measures are attributed to the intervention rather than being caused by any external factors.

Moreover, this type of correlation studies main limitations can lie in the generalizability of the findings. The outcomes which will be revealed in this situation may or may not be replicated under other circumstances, settings or with other participants. Hence, it is better for the researcher as well as readers to consider the concept of transferability of the findings instead of their generalizability. The researcher try to provide extensive details about the study context, allowing the applicability of the findings to other similar contexts (Finfgeld-Connett, 2010). Transferability considers the whole context of a study, applying

findings to comparable situations, while generalizability focuses mainly on how results can apply to different populations (Drisko, 2024).

Furthermore, there can be practical limitations related to the questionnaire instrument. This online questionnaire can take a long time to be answered by the learners compared to the direct in classroom ones. Similarly, course design decisions and hence the whole study depends on their responses on which the researcher has no control on their delivery and on limiting their time. Moreover, the study depends heavily on online procedures. Therefore, the internet access and availability for the researcher as well as the participants is a necessity.

Delimitations of the Study

Researchers fix a set of boundaries for the scope of the study commonly known as delimitations to make it achievable. Delimitations of a study require researchers explaining the reasons for not only the reasons for a specific selection, but also for not doing something or not choosing a particular option and rejecting other alternatives. Theofanidis and Fountouki (2019) state that delimiting the study mainly involves its theoretical framework, objectives, research questions, variables and sample.

The current study is not pure qualitative or exclusive quantitative in nature as it focuses on the in-depth understanding of the FCM as well as investigating any causal relationships between its implementation and the effectiveness of ESP teaching. It is not also only descriptive or exploratory since it engages the students and their lecturer to be active contributors throughout the research course.

Moreover, it is not interested in the university branches whose students do not need English for communication in their academic and future professional career as it aims at measuring the learners' readiness and attitudes towards English learning before and after conducting the study along with their awareness of its significance as an international language.

Besides, it does not depend on an experimental design and random sampling with control and experimental groups for the difficulty of its application in the Department of Mechanics and Drilling of Oil Fields. This was caused by English sessions have been devoted one hour and half a week for the whole batch in their timetable in one class. No students' grouping is possible. Furthermore, the pre- and post-study design will not be administered in the classroom in the attendance of the participants as the study will rely on their use of technology and its manipulation right from its departure. Very old literature is not the concern of our study since the latter's scope sheds the light on the modern educational practices depending on technological inventions and innovations.

Research Validity and Reliability

An important part of social science research is the quantification of human behaviour (Drost, 2011). In this study, we will try to measure the attitudes of the selected sample of oil drilling teachers and students in the Department of Mechanics and Drilling of Oil Fields towards the adoption of FCM as an educational approach and the extent to which their educational performance is influenced. To reach that end, the research tools have to be valid and reliable enough.

Validity is concerned with the meaningfulness of research components (Drost, 2011). Cohen et al. (2018) claim that combination quantitative and qualitative data intensifies research validity concerning the rigour of its design and relevance to the target objectives, questions and findings consistency with the given evidence. In addition, these researchers affirm that the unreliability of research instruments can cause significant errors to research. In an effort to achieve internal validity, experts in the field will be consulted about the suitability of the chosen research tools and design in depicting any causal relationship between teaching the designed English for Oil Drilling course and the implementation of FC. These experts' opinion is also necessary for the decision about the pre- and post- study design

appropriateness to the study sample, questions and objectives. The ESP teacher interview questions will be constructed based on their pre-study comments and suggestions along with the literature review related to the topic.

Likewise, the classroom observation will be conducted using a checklist containing detailed participants' behaviours and interactions such as learners' academic performance, cooperation, communication, engagement, and motivation. Observation is also accompanied by taking notes. Those items will be developed based on reviewing checklists previously set by experts in the field.

Another issue that can allow the interference of extraneous factors is the long interval between the pre- and post-study procedures in this action research resulting in doubtful scores. To prevent any serious errors, the researcher plans the course of the study in an acceptable period.

Another way to assess the study internal validity is the validation of the research tools by experts. After this step, the researcher will eliminate, modify, refine or rephrase any difficult, ambiguous and unnecessary items. The researcher will try to assess the construct validity of this study by comparing the findings of the student questionnaires to those of the ESP teacher interview and classroom observation. Additionally, these findings will be used to support each other as long as no contradictions appeared. As for the external validity, it is concerned with the generalizability of research findings to other settings, populations, or periods beyond those of the conducted study. Yet, in this current research, transferability is considered as more relevant than the generalizability of the findings.

As Kothari (2004) put it, "the suitable design will be one that minimizes bias and maximizes the reliability of the data collected and analyzed" (p. 14). Similarly, Volchok (2015) affirms that reliability refers to the extent of consistency of the results obtained from an experiment, test, or measurement procedure when repeated. According to this researcher,

research measures need to be free from random errors to achieve reliability.

To avoid any sort of randomness and inconsistencies in this study results, the data collection tools will be as detailed as possible to cover enough aspects related to the study participants, objectives, components, procedures and conditions of the FCM implementation, and its correlation to the ESP variable. In addition, their administration conditions will be taken into consideration. The pre- and post-study questionnaires will be sent to the learners' emails to be answered at the time that suits them. So, there will be no need to the test-retest reliability as their readiness to take the questionnaires will ensure their responses stability. The teacher interview will be conducted when the ESP teachers show willingness to cooperate with the researcher within the limited time of the study. The classroom observation conditions will be normalized as much as possible to eliminate the interference or influence of any extraneous factors such as the unfamiliarity of the courses setting. To measure the reliability indicator, data analysis software will be employed preventing any human raters' bias and maximizing the consistency of the results.

Chapter One

Chapter One: General Overview of English for Specific Purposes

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Introduction

Currently, English has a notable importance in the world due to the impact of globalization on academia and workplaces (Anthony, 2018). It has become an international communication medium. Parsaei et al. (2017) affirms that "learning English is incumbent on students of all fields, professions, and vocations" (p. 20). The requirement of its use in a variety of domains and for several reasons has led to the emergence of English for Specific Purposes (ESP). Although globalization has brought a variety of challenges, ESP learners have been empowered to effectively communicate and participate in academic and occupational settings through possessing the needed language and skills.

Alsharif and Shukri (2018) contend that developing of English for Special Purpose programs (ESP) becomes an impressing need due to the shift in the situation of English language to be an important communication tool worldwide and learnt for different causes and needs. Accordingly, ESP operates to meet the unique demands of students in many academic and professional contexts. Countries have started to train learners to be economically productive through functioning in the workplace using English. Therefore, ESP practitioners have been urged to get involved with language as well as subject content. At the present time, it is their role to understand its status in each branch, then plan and administer the appropriate highly efficient courses providing the appropriate learning experiences and job expectations.

Swales (1997) argues that just as the Tyrannosaurus rex was the apex predator in its ecosystem, English has become the prevailing language in many areas, including business, science, and technology. This researcher notes that this dominance has been achieved through a variety of factors, including the historical legacy of British colonialism, the economic and cultural influence of the United States, and the growth of global communication networks. Further, language is employed as a means of exerting dominating countries authority in

contemporary society (Swales, 1997).

Exploring the issue from an opposing angle, Swales (1997) acknowledges that the dominance of English also provides valuable opportunities, as it has facilitated communication and cooperation across cultures and has opened the doors of prosperity for many individuals. To reconcile the contrasting perspectives, this researcher argues that there should be an awareness of the potential dangers caused by linguistic imperialism. To that end, an emphasis is put on the necessity to work for the promotion of linguistic diversity and language rights.

Ehrenreich (2010) discusses the functions played by English as the international lingua franca. The latter helps workers of different ranks (workers and senior staff), cultures and nationalities to communicate for the achievement of a common goal. Another end has been sought in the academic community. Well-translated documents and user manuals prevent accidents and any risks. Moreover, it has prompted the need for equal opportunities for students, teachers and researchers to take part in international activities. These individuals are enabled to confidently share their knowledge, despite having less developed language skills or fluency. The impact of globalization on research has resulted in a rise in high-quality English-language publications, including journals and articles. It has been viewed the language of scientific conferences, seminars and meetings. Moreover, the increase of globalized immigration, refugees and travelling has created ethnic and linguistic diversity challenges for the hosting countries and universities in particular. The academic staff of the hosting countries universities has actively searched ways to integrate learners with diverse ethnic backgrounds and educational experiences, including non-native English speakers.

In addition to the present state of technological and economic advancement, the paramount importance of English requires governments to ensure policies related to advance, support and control the adoption of English in the educational systems (Anthony, 2018).

Being aware of such situation, the Algerian government has made the initiative of replacing French by English in higher education with a presidential decree since 2022. Moreover, another policy has been issued by the minister of higher education to promote the use of English to a medium of educational instruction. This shift intends to maintain the country on the wave of progress witnessed by the whole world.

Building upon the provided details, this research addresses the possibility of enhancing the status of ESP in the Algerian context by leveraging the innovative technology-based teaching trends. The study focuses on designing courses of English for Science and Technology (EST) in the Department of Mechanics and Drilling of Oil Fields at Kasdi Merbah Ouargla University as the case study. The study also intends to deliver that content using the FCM. Technology is used in language classes with different purposes. The rise of personal computers, the development of better communication tools, the advancement of the internet, the increased ability and use of online collaborative projects, the growth of in-sourcing, outsourcing and off-shoring businesses, and the progress of search engines, wireless technologies, and mobile devices has affected education and led to the emergence of new teaching approaches.

The electronic and digital media are used along with face-to-face teaching in the innovative practice of blended learning. It can be carried in many different ways among which is the Flipped Classroom Model (FCM). The latter inverses the traditional classroom lectures and homework. It starts with home instruction sent by the instructor to the learners via one of the already mentioned channels. It extends during class time for further practice and discussion during the in-person classes. It ends up in the post-class time through further discussion, explanation, participation, production or innovations. FCM aims at pushing the learners to give their maximum through being highly engaged and motivated.

Now with English becoming the first foreign language in Algeria and its growing

academic and economic significance, teaching English has emerged as a requirement at the university level to be used in future workplace settings. Oil drilling students -being the case study of this current study- are in necessity of certain language qualifications, enough professional experience and expectations to improve their employment chances both nationally and internationally.

Chapter One presents definitions of English for Specific Purposes (ESP) provided by several researchers. In addition, it introduces the fundamental branches of ESP and compares it with other English Language Teaching (ELT) approaches. Moreover, the chapter describes the characteristics of ESP that meet learners' specific needs while highlighting how it differs from other teaching approaches. It also sheds the light on the similarities and differences between ESP and English for General Purposes (EGP). Interestingly, the chapter presents the methods of teaching ESP in the digital age. Finally, the chapter clarifies any confusion surrounding ESP.

1.1. Definition of English for Specific Purposes

Woodrow (2022) affirms that English for Specific Purposes (ESP) is "a relatively new area of investigation in applied linguistics and teaching English to Speakers of Other Languages (TESOL) research" (p. 1) which emerged in the 1960s. Then, it has developed as part of English as Second Language Teaching (ESLT) since the 1970s and 1980s mainly because of the introduction of Communicative Approach.

Hutchinson and Waters (1987) contend that it aims at meeting the increasing need of people worldwide to communicate employing English for precise reasons such as business and trading. Anthony (2018) considers it as "the most established of the teaching approaches in English Language Teaching (ELT)" (p. 9) as it has been the focus of interest of many researchers since its emergence. Moreover, students need to use ESP as an effective tool for gaining knowledge to learn a second language, rather than simply studying the language for

its own sake (Özbaş & Güryay, 2014).

1.2. ESP as an Educational Approach

English for Specific Purposes (ESP) has been a response to the international demand for English education. In the perspective of Hutchinson and Waters (1987), "ESP is not a particular kind of language or methodology, nor does it consist of a particular type of teaching material. Understood properly, it is an approach to language learning, which is based on learner need" (p. 19). Putting it differently, ESP is a personalized approach to teaching language. It is customized to the learners' needs to enable them to train and practise specific professional skills.

For Hutchinson and Waters (1987), ESP resembles all other language teaching methodologies, but rather than questioning how individuals learn, it prioritizes the content of what they should learn. In addition, it is not basically different from them in having exclusive teaching methodology. Moreover, they also define ESP by what it is not. ESP is not limited to teaching specialized English tailored for particular areas of expertise. Furthermore, it is not exclusively restricted to the instruction of vocabulary and grammar to particular professional domains. Alternatively, ESP covers a wide-ranging scope of knowledge and skills that empower learners to proficiently utilize language.

Other definitions for ESP have been provided by a number of scholars. Hutchinson and Waters (1987) introduce it as a language teaching approach in which the course content, method and materials rely on learners' motive for learning English. Paltridge and Starfield, (2014) consider this approach more regular for adult learners believing that their learning objectives are expected to be more explicit. Dudley-Evans et al. (1998) identify it as an ELT branch with its particular qualities and an applied linguistics research component. Theses researchers state that it is an eclectic approach based on research in a variety of disciplines. From a broad perspective, it is "a part of more general movement of teaching language for

Specific Purposes (LSP)" (Dudley-Evans et al., 1998, p. 1). LSP emphasizes teaching languages for specific purposes like Spanish, German and English. Its goal is to enable learners use language functions including explaining, advising, suggesting, informing, clarifying, listing, persuading, arguing, agreeing, etc in particular academic and professional or workplace settings.

Table 1

Characteristics of English for Specific Purposes (ESP)

Characteristic	***Comment***
Adult learners	ESP learners are typically adult; for example, university students learning EAP or business managers learning business English
Course informed by learner needs	ESP courses are informed by learner needs There is no attempt to teach the language as a whole, for example, using a full grammar syllabus
Lexis	ESP courses are often defined by the lexis in the field; this is why corpus studies are so prevalent in ESP research
Learners have a common goal	Usually, learners are studying ESP for a similar reason; for example a course in legal English or graduate EAP
Often targets specific skills	For example, in English for nurses, the skill of communicating with patients is likely to be addressed. In EAP academic writing is vital
May combine content and language. ESP courses have different levels of specificity	Content and language integrated learning (CLIL) and English medium instruction (EMI) courses teach a subject though English
Teaching methodology often more akin to subject area than typical EFL approaches	For example, business English courses may use a case study approach

(*Note.* Adapted from Woodrow, 2022, p. 3)

According to Woodrow (2022), ESP goes beyond teaching mere language system to encompass new skills for predominantly adult learners as their academic career and profession needs differ from those of children and teenagers. It integrates language learning with an academic discipline. Anthony (2018) describes ESP as an approach addressing the learners' present and/or future academic or professional needs. This researcher highlights its emphasis on the essential language, genres, and skills facilitating the fulfillment of those demands. This is achieved through employing tailored educational materials and strategies.

Ramírez (2015) puts emphasis on ESP's learner-centeredness as it aims to satisfy their academic and professional requirements.

1.3. Origins and Development of ESP

English for Specific Purposes (ESP) has been a response to the international demand for English education. In the view of Hutchinson and Waters (1987), ESP does not refer to a distinct kind of language or methodology, nor does it rely on a particular type of teaching material. Rather, it is better understood as an approach to language learning, prioritising learner's needs. Putting it differently, ESP is a personalized approach to teaching a language as its components are designed to suit the students. Thus, ESP has been created and developed in response to the increasing need for English as a global communication tool in all domains.

It has been said that language for specific purposes went back to the Roman and Greek Empires. As for ESP, Dudley-Evans et al. (1998) declare that it has emerged as a necessary movement in ESLT or EFLT from 1960s and on. It has developed out of being a means of communication between businessmen speaking different languages. It is divided into two major divisions English for Academic Purposes and English for Occupational Purposes. These divisions themselves are subdivided into other branches such as English for Legal Purposes, English for Socio-cultural Purposes, English for Medical Purposes and many other types. In our study, we put focus on English for Science and Technology.

Economically speaking, trade and commerce have transformed English to become a global lingua franca throughout history. First, the arrival of the 16th Century refugee artisans and craftsmen to England necessitated the use of English as a communication medium. After the Second World War, the USA, Canada and the UK started to make deals to rebuild the economic infrastructure of countries in Africa, Asia and Europe in the 1940s. In addition to business deals, they exported technological and technical goods and services supported by technical manuals and reports written in English. Mutual collaborative as well as international

research journals publications in English prospered at this era. Computer industry, most of which was done in USA, was another factor putting English in this uncontested position. Anthony (2018) declared that “these developments led to the creation of new programming languages based on English, new communications standards written in English, and the use of English as the primary language for radio communications, aviation, and later the Internet” (p. 29).

Historically speaking, Waters and Hutchinson (1987) date its emergence back with English language becoming a tool for international communication as a response to the revolutionary and massive growth of business, science and technology of the Second World War. They mention the 1970s Oil Crisis as an important event affecting the development of ESP. At that time, western knowledge moved into the oil producing nations where English was the only communication option. Consequently, the focus has shifted from studying mere linguistic items of English to its use of language in communicative situations.

Dou et al. (2023) maintain that the traditional discussion of EFL teaching by teachers and linguists is in fact making reference to what becomes known as General English. This situation has changed with ESP gaining popularity. It has dominated due to the ongoing search for better ways to enhance the effectiveness of the foreign language teaching process.

ESP has been the child of its time. It has been created by the surrounding circumstances of society and history. It can be viewed as a medium to explain past and current trends and concepts in ESP learning (Ramírez, 2015). Many scholars study the history of ESP and divide it into stages regarding the features of each historical era and the following is a summary of data presented by Paltridge and Starfield (2014). At its early life from 1962 to 1981, ESP was merely EAP and a little emphasis was put on EOP. Language has been referred to broadly as a load of linguistic devices or means notably lexis, syntax, grammar, semantics, pragmatics and phonology.

Then, its study moved to count the number of grammatical features in English for Science and Technology (EST) academic texts; it describes the way they occur there and find out an EST grammar particular pattern. A shift of focus characterizes the recent years of its development with the growth of global business. This area has attracted a huge amount of publications in English language and a great interest of instructors, publishers and companies.

In contrast to their antecedents, Tarone (1981) shed the light on two main characteristics of ESP: First, narrowing down the studies to scientific prose and syntactic voice instead of the whole scientific language across genres; second, emphasizing the significance of considering a specialist informant's consultations about the subject content (as cited in Paltridge & Starfield, 2014).

Next, the scope of ESP had been broadened to include significant concepts in the period extending from 1981 to 1990 with the emergence of Genre Analysis. The employed materials during this period ranged from posters presentation in meetings, posters in speeches, telexes to cover a limited employment of computer-assisted programs. Adamson (1990) carried out a study and found that teaching ESP is more effective when it addresses academic content. The third period identified by Paltridge and Starfield (2014) extended between 1990 and 2011 and was dominated by Genre Analysis. Genre theorists and practitioners worked to find solutions to theoretical and pedagogical differences in their views and goals. According to Anthony (2018), the last stage of ESP development focuses "on the fact that ESP addresses many different facets of the communication process that are needed to achieve a particular goal". By way of explanation, ESP tackles communicative issues necessary for accomplishing specific purposes using language.

For the recent era of information technology, ESP teaching developement can be enhanced by incoroporating technology in ESP courses and programs. Dou et al. (2023) argue that "through specially designed multimedia packages tailored to students' needs, students can

easily be exposed to authentic target language use, thus allowing more language practice that is often lacking in traditional materials" (p. 7). There is inevitability of employing new teaching materials (e.g. online platforms) and approaches (e.g. blended and flipped learning models) that incorporate technology with this new ESP generation of learners.

Based on the insights of a study about teaching English in Chinese colleges, Yu and Liu (2018) found that the progress of science and technology, supported by significant private investment by parents have allowed students access for more learning resources and opportunities to engage with English. These researchers ask these questions for further research "the controversy over students' English proficiency points to the issue of whether students need to fulfill certain minimum requirements in language proficiency before enrolling in ESP courses, and if so, how can these requirements be defined and measured?" (p. 148). Bolton (2008) also worries about the issue of proficiency and describes it as important in ESP (as cited in Bhatia et al., 2011). Bhatia et al. (2011) contend that the reason stems from the fact that "the language used must effectively and efficiently receive and convey messages for work or professional purposes" (p. 148). It seems to be concluding that ESP departs from the learners'needs and ends with them putting its requirements and skills into practice to fulfill their objectives in academia and workplace.

Based on the preceding points, the emergence and development of ESP has been related to the change in societal and historical needs. Ramírez (2015) states it clearly that the main aim of ESP since its emergence is to address the learners' needs and learn a language that enables them to communicate in a globalized world where immediate requirements are best met by English for Specific Purposes instruction. This section shows how ESP teaching and underlying concepts have developed throughout history. It also investigates the new forms of ESP needs analysis and the modern materials in designing and teaching ESP courses and curricula. Dou et al. (2023) contend that the changes in ESP development cause changes

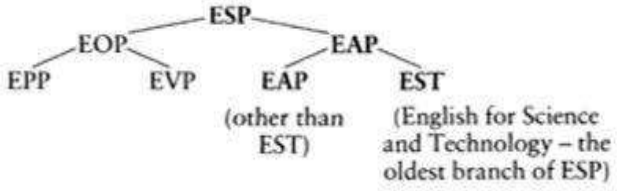
in learning approaches, and hence, serious considerations have to be taken into account for effective learning.

1.4. ESP Divisions

St John (1996) considers ESP as "an umbrella term embracing a number of sub-divisions of which two key ones in many definitions are EAP (English for Academic Purposes) and EOP (English for Occupational Purposes)" (p. 3). The use of these two main strands depends on the context where English language, genres and skills occur. According to Bhatia et al. (2008), students are supposed to have the basics of English language as well as qualities of professional genres to effectively communicate in professional settings. For instance, learning to read and write research articles requires learners' involvement with relevant vocabulary and structures along with the reasons behind these features.

Figure 1

English for Science and Technology as a Branch of ESP



(*Note.* Adapted from R.R. Jordan, 1997, p. 3)

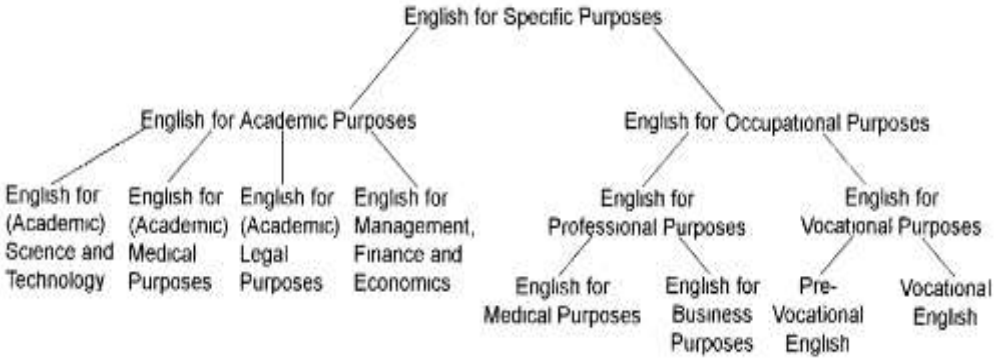
Jordan (1997) outlines the essential differences between EAP and EOP through a set of examples. '*Doctors'* belongs to EOP while '*medicine'* fits in English for Academic Purposes. In EAP, trainee doctors (or in-service) need material facilitating communication in specific casual situations with patients. In the meantime, students intended to be doctors are instructed to practice reading texts and listening to lectures.

Many other ESP sub-branches have emerged in response to the growing demands of stakeholders acknowledging the significance of learning ESP tailored to meet the specific

requirements of specific occupational disciplines in globalized developing economies (Dou et al., 2023).

Figure 2

ESP Classification by Professional Area



(*Note.* Adapted from Dudley-Evans and St John, 1998, p. 6)

1.4.1. English for Academic Purposes (EAP)

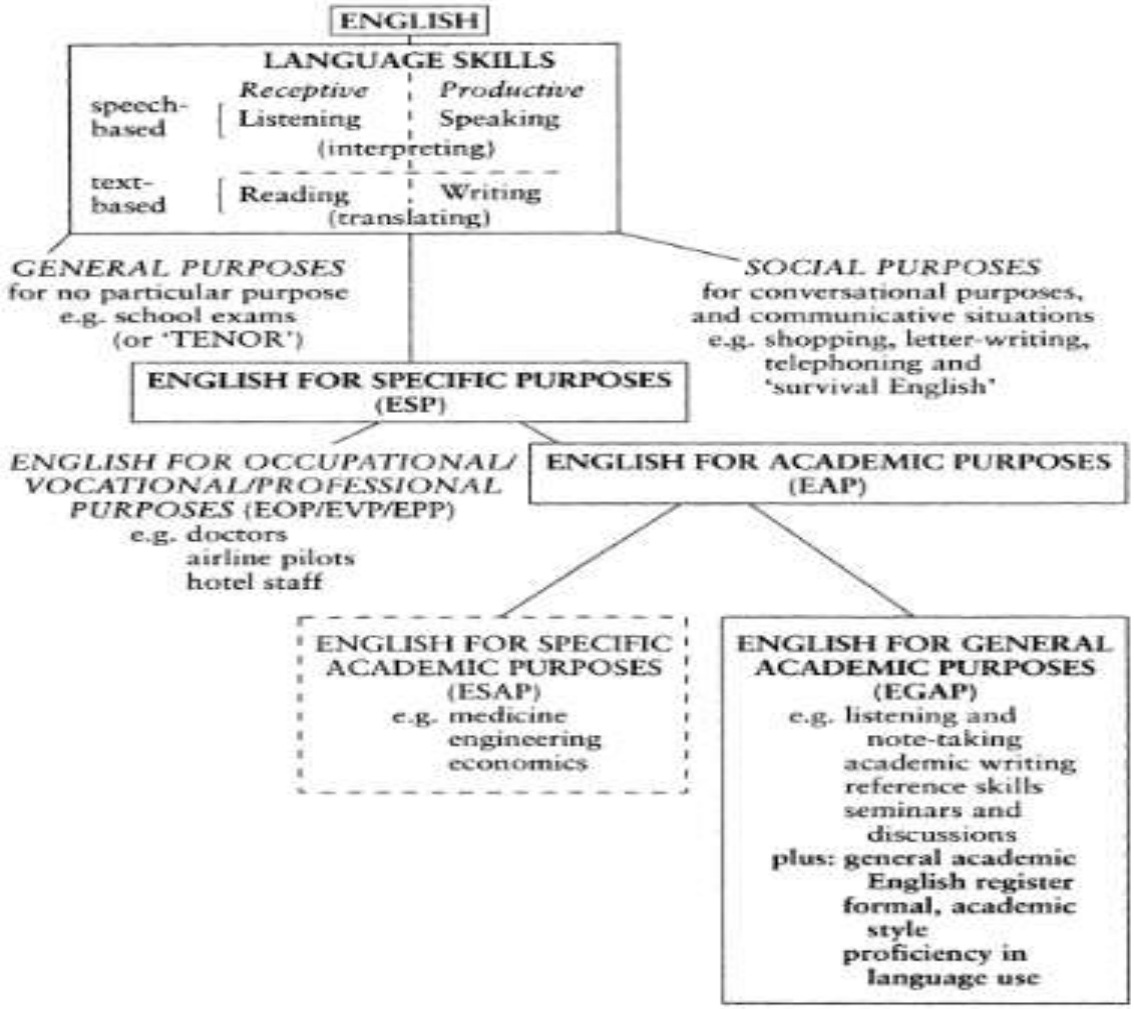
The term English for Academic Purposes is coined by Tim Johns in 1974 and first appeared in papers collection by Cowie and Heaton in 1977 (Hyland, 2006). Its expansion has been stimulated by the modern economic policy of English-speaking countries making high profits from providing education for fee-paying foreign learners. That is, these students contribute to the economic growth of those countries and are in need of EAP courses. Hyland (2006) contends that EAP focuses on teaching English to help learners in their academic journey or research. This researcher also affirms that EAP is addresses all areas of academic communicative practice.

As put forth by Charles and Pecorari (2016), EAP focuses on setting clear goals to enable learners' acquisition of English they need for a particular purpose.The term was first used in 1974. John Swales, one of the leading figures in EAP, regards it as a fundamentally positive movement which plays a vital role in assisting second language (L2) learners in adapting and success in an Anglophone academic world. John Swales also emphasizes its

significance and asks whether the dominance of English has been achieved at the expense of neglecting many other languages.

Figure 3

EAP and Study Skills: Definition and Scope



(*Note.* adapted from R.R. Jordan, 1997, p. 3)

As per Jordan (1997), EAP addresses the development of English language communication skills required for academic study within formal educational frameworks. He presents some of those educational contexts EAP may occur in. This encompasses purely English-speaking situations (such as UK and USA) along with non-native English surroundings where is needed as a foreign (such as Finland and Germany) or second language or medium of instruction in the educational institutions (such as India and Anglophone

African countries). Jordan further provides some aims for EAP use in learners' own countries such as employing it to read academic texts in higher education level as well as pre-travel courses to facilitate effective interaction with natives when studying abroad.

Hyland (2006) affirms that EAP represents an important activity in language education nowadays. He claims that EAP provides "systematic, locally managed, solution-oriented approaches" (p. 4) to the challenges hindering learners' academic career by meeting their needs and discipline-specific communication skills. Moreover, EAP courses and programs are intended for both native and non-native English speakers. In the same vein, Woodrow (2018) maintains that EAP courses extend from English for general academic purposes (EGAP) like pre-sessional English courses, to put emphasis on content in English for specific academic purposes (ESAP) courses.

In Hyland's view (2006), non-native students are required to obtain the essential competencies enabling them to creatively apply their field of study knowledge in the appropriate international research domains, and finally write reports in highly-ranked international journals. However, he points out to the fact that the majority of instructors are non-native speakers of English. As a result, the EAP materials and programs of teacher-training have changed. In Algeria, the ministry of higher education encourages the employment of English in all academic spheres such as postgraduate thesis writing and presentation, training of all university teachers.

EAP courses and programs encounter a range of challenges. To start with, they are not based on teachers' or course designers' personal experiences or intuition, but rather on a theoretical foundation and findings of systematic research (Hyland, 2006). Moving to the dominance of English as the means of communication in academic arena and highly-ranked publications, language diversity in academic production has disappeared or diminished. Many scholars and journals have withdrawn to the use of English to ensure presence in competitive

international settings.

However, Hyland (2006) believes that using English in academic contexts means that language is no longer a hindrance to accessing and acquiring knowledge as a growing number of people is able to access research findings and take part in international academic networks. Alternatively put, the emergence of English as a lingua franca unites academicians all over the world. Many of its varieties come to existence without depending on neither childhood linguistic background nor cultural identity.

Types of EAP Courses

EAP is typically offered in various environments, which can depend on the learners' educational level (Woodrow, 2018). Woodrow presents three types. Firstly**,** foundation EAP courses or direct-entry courses target upper high school students and imply teaching both the fundamental concepts and skills required in a specific academic subject and the language skills related to academic contexts. They are full-time and offered in the students' home country, in the hosting country where undergraduate studies are to be pursued, or a combination of both.

Secondly, pre-sessional EAP courses are language and academic preparation courses that full-fee-paying international heterogeneous groups of students frequently take before starting their academic studies. They typically focus on English for General Academic Purposes (EGAP) involving various communicative situations. They aim to provide students with language instruction and academic skills for succeeding in their studies.

Thirdly, in-sessional courses can be voluntary or compulsory and are taken by students to improve their language proficiency and academic skills while simultaneously pursuing their academic studies. Students can enroll in these courses depending on their performance in language tests determining their weaknesses in academic communication.

1.4.2. English for Occupational Purposes (EOP)

Ehrenreich (2010) affirms that "in the 21st century, English has become an indispensable "must" in the company and that there is a general understanding that staff at all levels develop their language skills as they see appropriate for their roles within the company" (p. 408). She proclaims that the main goal of language learning in business settings is fostering the ability to use English as a lingua franca in international business interactions. That is, they need English to engage in successful communication with people from diverse linguistic and cultural backgrounds, regardless of their native or non-native English proficiency. Anthony (2018) sustains that limited communication with co-workers may involve them in simplifying or failing to document tasks. They might also hesitate to use English.

English for Occupational Purposes (EOP) is also called English for Professional/ Vocational Purposes (EPP/ EVP). It differs from English for Academic Purposes (EAP) in terms of aims. It is concerned with the understanding of the language of workplace of each profession including medicine, administration, law and business including English for business. Accordingly, Woodrow (2022) declares that ESP- of which EOP is a part- represents the language requirements of the professional settings, giving priority to English as a lingua franca (ELF). Paltridge and Starfield (2014) presented the example of aircraft crew anticipated to identify phrases specific to their work area and to be able to use English communication with people from different nationalities.

With the increasing number of overseas students, the notion of *'World Englishes'* has appeared to depict the new status of English as being no more exclusively owned by English speaking countries. Consequently, an urgent need for ESP programs and specialized practitioners for each university major have appeared to avoid literal word-isolated translation of documents namely user guides and safety manuals. This growing attention to occupational English has been manifested in the proliferation of many book titles on the subject, for

instance, Business Concepts for English Practice written by Dowling and McDougal (1982) and Business English of Wilbert and Lewis (1990).

Woodrow (2018) distinguishes between academic EOP and job-experienced EOP; the former develops the learners' acquisition of the discipline expert knowledge in parallel with communication ability to succeed in academic settings such as universities, research institutions, etc, while the latter improves the language and communication requirements of particular industries and workplaces. This researcher affirms that EOP encompasses several specialized spheres such as English for legal purposes (law studies), English for medical purposes (for students of pharmacy, dentistry, nursing, etc), English for science and technological purposes and English for engineering purposes.

The procedures of designing effective ESP programs and training specialized practitioners aim at enhancing the job opportunities of the graduates especially in the non-speaking English countries. In addition, ESP courses and programs in higher education reduce the costs of training of the companies. This contributes at preparing ready qualified workers who can communicate using English smoothly without low confidence or any mutual misunderstandings.

Ahmad Kamil and Muhammad (2021) state that graduate employability involves graduates to secure jobs that match to their academic discipline, meet their qualifications, and offer salaries for novice workers that are consistent with worldwide standards. These researchers conduct a systematic literature review in search of English language workplace communication needs. They work for designing EOP courses adequately meeting industry demands in the Malaysian context where English is the lingua franca of multinational companies. They find that the main obstacles faced by Malaysian graduates in obtaining employment are: their inadequate and lower English language proficiency mainly written or

spoken communicating along with a minimum of English proficiency level being set by some industries as a prerequisite for offering jobs to graduates.

Manyika et al., (2016) link the issue with the current networking advancements. They point out that digital platforms present a set of benefits: They provide opportunities for the students to acquire knowledge, engage in collaborative contributions, and develop new skills from one hand, then assist these trained students to exhibit their potential to prospective employers. Instances of this situation can be observed through finding freelance work, posting professional profiles on LinkedIn, content creation with creativity and innovation on YouTube, etc where English is needed to ensure more success in professional life.

1.5. Philosophical Background of ESP

Richards and Rodgers (2014) assert the eclectic nature of ESP through the adoption of other theories' effective ideas, principles and procedures. Most useful, successful, and valid concepts have been taken from the Communicative Language Teaching (CLT), Task-Based Language Teaching (TBLT), Project-Based Learning (PBL) along with other teaching approaches. However, some aspects remain ESP-specific such as learner-centeredness and ESP practitioner-subject expert cooperation.

1.5.1. Adoption of Learning-Centeredness

Because it departs from learners' needs, ESP can be referred to a learner-centered approach. It provides them with opportunities to express their ideas, reflect on others practices and solve different problems. Rao (2014) claims that learner-centered education prioritises tailoring class instruction to meet learners' individual needs. His view stimulates learning via techniques that involve learners directly. This researcher declares that the students are given the opportunity to apply grammar rules in practical situations and link grammar learning to real-life scenarios. It is important to teach technical vocabulary so that learners can use words accurately and appropriately for better communication.

Far (2008) describes EGP as providing broad and undefined goals unlike the detailed and selective specific goals and contexts of ESP. That is, ESP syllabuses, curriculums and courses are designed according to the needs of learners, being them a specific skill or language knowledge. In addition, the four skills are not necessarily emphasized as a whole like in EGP, but rather only the needed one is targeted and taught. In the view of Ghafournia and Sabet (2014), ESP curricula emphasize learner-centeredness by making learners' needs a priority. They criticize the impracticality of rigidly implementing a pre-determined syllabus and methodology.

1.5.2. ESP Practitioner-Content Expert Cooperation

ESP teachers may find themselves less informed and experienced in the subject than their learners (Basturkmen, 2010). Therefore, they need to be in an ongoing contact with their learners through careful listening, deep discussion and negotiation to interpret their perception of the whole educational process they are involved in. By consulting their students, they keep informed about their students' needs, perspectives and also their attitudes towards the teaching practices, content and the chosen materials.

An ESP practitioner is required to have a certain degree of knowledge related to the discipline. This instructor assists at making decisions about the appropriate language to be taught and the way to be used in. by doing so, they become able to provide feedback to the content instructors who may lack familiarity with second language teaching contexts (Ghafournia & Sabet, 2014).

More importantly, Anthony (2018) agrees with some scholars on having what he named *'team-teaching in ESP'* indicating a sort of balanced mutual collaboration between a teacher of English and a specialist in the field of study who would determine the suitable course content and materials. They can collaborate with this subject expert through timetable adaptation and constant interaction to collect the necessary information and knowledge about

the best content for students.

Basturkmen (2010) points out that educator may involve with content in an occupation or discipline that they have minimal or no background knowledge. Dudley-Evans and St John (1998) distinguish three categories of collaboration depending on the extent of contact between the ESP practitioner and subject specialist. Firstly, cooperation entails little contribution from the subject specialist. Secondly, collaboration reflects a situation where the ESP practitioner and subject specialist work in closer partnership. Lastly, team-teaching through which the highest collaboration is achieved and the ESP practitioner and subject specialist jointly teach the ESP class.

1.6. ESP Teacher's Role as Active Practitioners

Dudley-Evans et al. (1998) see an ESP teacher as a practitioner i.e. "teacher, course designer and materials provider, collaborator, researcher, evaluator" (p.13). Being a 'practitioner', the ESP teacher's work involves going beyond teaching only to take account of other functions such as designing courses and programs, providing materials, collaborating with learners and other subject teachers, ongoing research, and evaluation of the classroom procedures, interactions and content.

Ongoing researcher: ESP implies a continuous investigation in the genres, language and skills which are fundamental in a specific field of study. Ghafournia and Sabet (2014) argue that ESP practitioners should undertake comprehensive researches to determine the learners' needs in order to develop effective courses. They consider those educators as action-based researchers and theoreticians who are able to uncover innovative insights and methodologies meeting ESP learners' needs and contexts.

Material provider: ESP practitioners can select the appropriate teaching resources from the already available published ones and adapt it- if necessary- to their learners' needs. Otherwise, they write the courses after conducting a needs analysis. They are required to

assess the quality of the materials being them self-produced or published (Dudley-Evans et al., 1998).

Classroom organizer: ESP teachers take the responsibility of organizing classes. According to Far (2008), they set short-term as well as long-term objectives for the courses, upon which they build an educational curriculum with scheduled time of the incorporated activities. They also select or design course materials and plan the skills to be fostered. On another side, they organize class procedures of turn taking, discussion opportunities, providing feedback, etc to create a positive learning environment.

Learners' evaluator: Evaluating learners is an important role to be assumed by the ESP teachers as they are enabled to identify their learners' challenging issues and address them (Far, 2008), and hence, constantly check their progress.

Course designer: Drawing on the insights of other researchers, Woodrow (2018) finds that published materials regularly do not meet the specific needs of students, and hence, it is ESP practitioners' role to design courses as well as to select and/or adapt materials of existing ones.

The teacher as an assessor: In ESP, evaluation and assessment play an important role, as the engaged parties typically need to know how effective the programme is. The ESP practitioners play a critical role in this as they may be solely responsible for student assessment. Assessment can be: first, informal and formative using engaging classroom activities and tests that seek to support and inform learning; second, summative that formally measures student performance (Woodrow, 2018).

1.7. Differences between ESP and Other Approaches to Language Teaching

1.7.1. ESP vs. English as a Second Language and English as a Foreign Language

ESP differs from ESL (English as a Second Language), EFL (English as a Foreign Language) and EGP (English for General Purposes) because of its oriented focus (Alvi et al.,

2021). Basturkmen (2010) argues that a number of teachers find a minimal distinction between English Language Teaching (ELT) and ESP despite having the same aim of enhancing learners' communicative competence. This researcher refers to the concepts of 'external and internal goals for language teaching'; the first stands for the practical application of language outside classroom and accomplish tasks in real world, e.g. buying at the groceries, while the latter is the focus of ESP and pertains to the educational goals within class including fostering cognitive and social skills.

An additional variation, Basturkmen (2010) asserts that while ELT puts more emphasis on the structural components of the language, ESP is primarily concerned with teaching the language needed in specific contexts like work or studies. In other words, they mainly differ in focus on 'use' and 'usage' with variation in degree. Basturkmen also highlights the point that ESP teaches the areas of expertise that the typical educated native speaker is not familiar with. For instance, teaching English to nurses delivers a course content including medical terminology, typical patterns of nurse–patient interaction, written genres (e.g. patient records). These components are not necessarily used in the regular communicative situations outside nursing area. Another important difference emerges from ESP instructor's conscious understanding of the language skills or characteristics involved in its use like presentation and discussion skills (Basturkmen, 2010). Instructing ESP, then, places extra responsibilities on the teacher compared to ELT.

1.7.2. ESP vs. Communicative Approach

Hutchinson and Waters (1984) believe that traditional ESP course design reveals two key shortcomings: "firstly, the development in the learner of a capacity to communicate is neglected, and secondly, there is a failure to analyse and take into account the realities of the ESP learning situation"(p. 108). They argue that this is due to the teachers' lack of knowledge in the subject matter along with the selection of non-communicative materials,

content and language exercises. They also link learner-centeredness to the communicative nature of ESP which stands in contrast to the traditional –in their words- 'learner-dominated approach'.

Hutchinson and Waters (1984) define communicative approach as being rooted in negotiation among all the involved participants and having consideration for their needs and expectations in the process of course design and teaching methodology selection. They argue that educators can be hindered from communicating appropriately when the texts require a high level of specialist knowledge of a particular target situation. However, Hutchinson and Waters (1984) state that instructors do not need specialized knowledge. Instead, those teachers necessitate a general understanding, allowing them to ask insightful questions about the topic instead of direct ones. In this way, ESP practitioners can maintain effective discussion with subject teachers as well as learners and fosters learners' critical thinking skills.

One other difference between ESP and the communicative approach is related to the concepts of competence and discourse types. A study of discourse types in the target situation is necessary to discover what competence is required to address each of those situations (Hutchinson and Waters, 1984). These researchers refer to the concept of competence as going beyond linguistic proficiency to integrate socio-cultural or everyday scientific/technical knowledge along with the capability of applying cognitive processing strategies. In other words, ESP utilizes specific subject-specific professional contexts, vocabulary and skills, whereas the communicative approach focuses on general communication skills for everyday situations. Accordingly, the communicative approach gives priority to fluency and interaction over specialized knowledge.

A further distinction is related to these approaches focus. ESP course design considers the requirements of the target situation, the needs and challenges of the ESP learning situation as

well as the necessities of the teaching approach (e.g. learning theories, human and physical resources, background and perspectives from learning English) (Hutchinson and Waters, 1984). By contrast, the communicative approach focuses on general language proficiency and communication skills.

1.7.3. Differences between ESP and English for General Purposes (EGP)

English has been taught in different contexts and for different purposes. In higher education, two types of English are presented: general and specific. As Howcroft (1999) indicates, this distinction is important "to apply the findings to syllabi for teaching purposes to provide the students of those courses with tailor-made material and information about the language they needed in their studies of a particular subject" (p. 49). In the words of Kitkauskienė (2006), both types foster individuals' communication skill orally and in written form. They present a linguistic knowledge consisting of grammatical correctness and words appropriateness of the conveyed message. However, since ESP has emerged as a separate approach, it is necessary to point out the main characteristics differentiating it from other English teaching-learning approaches notably English for General Purposes (EGP). Ghafournia and Sabet (2014) affirm that ESP teachers' responsibilities surpass those assigned to EGP teachers. In addition to the above-highlighted concepts of learner-centeredness and cooperation with subject-experts in designing and teaching courses, the following are primary distinguishing features.

Specific Domains and Purposes

Hyland and Jiang (2021) contend that ESP differs from general English due to its focused emphasis on specific uses of language. Charles and Pecorari (2016) claim that the ESP movement emerged over acknowledging that specialized individuals have to acquire English specific for particular domains. Another reason for its emergence in the view of these researchers is the belief that general English education was not fulfilling the learners'

requirements in two respects: “by providing instruction that was less than directly relevant” on one hand and “by failing to provide what they did need, whether that was the ability, for an engineer, to write a technical specification or, for a pilot, to communicate with air traffic control” (Hyland & Jiang, 2021, pp. 60-61) on the other hand. Moreover, unlike ESP, English for General Purposes (EGP) is related to educational contexts where learners needs cannot be easily determined (Popescu, 2010).

Focused Teaching

As per Altalib's (2019) perspective, the scope of focus of ESP courses is narrower in than those of EGP.Hyland and Jiang (2021) state that ESP “grew out of text-based counts of grammar features in written technical documents, which quickly gave way to more explanatory models which sought to connect technical lexico-grammar and authors’ rhetorical purposes” (p. 14). In the view of Hyland (2006), ESP emerges as an approach to language teaching which identifies the specific language features, discourse practices, and communicative skills of target students meanwhile considering the subject-matter needs and knowledge of learners (as cited in Hyland & Jiang, 2021). In contrast to ESP that depends on needs analysis to facilitate the determination of ESP courses or programs content, EGP course content is more challenging because of the unpredictable nature of learners’ needs (Far, 2008).

In opposition to ESP, Hyland (2006) EGP teachers focus on course content and activities that are applicable in different academic disciplines (as cited in Altalib, 2019). Kitkauskienė (2006) asserts that general language teaching centers around the basics of grammar, structures and phonetics and equip learners with foundational skills for possible future language studies. This researcher believes that, unlike general English, ESP focuses on language in real-world contexts whereas EGP generally teach it in isolation. Kitkauskienė (2006) sustains that the content of ESP courses is targeted to the subject itself and teaches

learners' profound professional knowledge and "it is difficult to determine where language learning ends and where subject learning starts or vice versa" (p. 89). Conversely, EGP is mainly grammar rules explanation and practice and learning long vocabulary lists (Anthony, 2018).

Multi-Disciplinarity

Based on Ignjatović's (2020) assertion, multi-disciplinarity entails broadening the scope and deepening the understanding of one discipline by integrating insights knowledge from diverse disciplines. Zuyenok (2011) states that a multi-disciplinary approach is employed in problem solving and it involves connecting it to multiple disciplines and reconsidering that problem from other perspectives in order to find out solutions based on the new simplified situations. The ESP practitioners' provide the necessary content for the learners to guarantee their successful communication. On another side, the specialist informants may contribute into designing and teaching high quality courses and programs through providing the right teaching content covering the appropriate language, genres and skills as well as evaluating their success.

Unique Methodology and Specific Teaching

In ESP classes, the teachers are not the only source of knowledge and can be less knowledgeable about their discipline content than their learners. Therefore, a specific teaching methodology is followed to drag them to discuss that knowledge using the appropriate language. So, a search for appropriate teaching methods which would create a sort of collaboration between them is necessary.

In this vein, Woodrow (2018) maintains that the teaching methodologies and techniques employed in the courses or programs designed for the preparation of future EGP teachers may not address the specific requirements of teaching ESP. In other words, ESP practitioners have to take into account the suitability of the methodology and instructional

methods employed in delivering an ESP course. Woodrow (2018) considers for instance the stick-it note attached to the learners' heads as inappropriate for an advanced class of Chinese university administrators. This may be due to cultural aspects like maintaining personal space and professional considerations such as more serious and directly applicable communicative activities related to negotiations and presentations.

Learners' Motivation

Learners who demonstrate strong motivation and positive attitude towards their learning are more encouraged to engage in communication, and hence, improve the effectiveness of their language learning (Altalib, 2019). Dudley-Evans et al. (1998) assert that "ESP teaching is more motivating for learners than General English" (p. 9) because of the specific scope of the instruction, its usefulness and the high quality of teaching it provides regarding the cost-effective courses. Altalib (2019) supports the view that ESP courses are purposefully designed to make efficient use of learners' time and effort. These factors push the students to take a positive attitude towards its objectives. Popescu (2010) claim that ESP increases learners' motivation as it meets their needs and makes them aware of their specific purposes for acquiring English.

ESP Learners and Adult Learning Principles

Ghafournia and Sabet (2014) argue thatit is important to tailor teaching and learning processes within ESP settings to align with the unique specifications and features of adult learners such as learners' self-directed learning, autonomy, motivation, self-confidence, etc. They add that ESP students who are mostly working professionals and secondary learners prioritise experiential learning over relying extensively on academic texts and media.

Sherali-qizi (2023) affirms that ESP students are usually adults with prior knowledge English basics as well as a defined purpose for learning English for demonstrating a set of professional skills and performing job-related tasks. On the contrary, learners' age ranges

from children to adults in EGP classes which focus on language per se (Far, 2008).

Furthermore, Ghafournia and Sabet (2014) state that ESP is characterized by learners' awareness of the learning process and learners are considered as participants in achieving particular academic and professional objectives. They conclude that ESP learners voluntarily learn with a clear purpose in self-directed method, and consequently, can be counseled about their learning and psychological needs.

ESP and Intercultural Competence

Compared to EGP which emphasizes the linguistic level, ESP sets a link between language and culture. As put forth by Ghafournia and Sabet (2014), ESP teachers carry higher level of seriousness than EGP teachers as they surpass the delivering traditional role of delivering linguistic content. ESP students do not learn English alone or for its own sake, but rather they acquire the socio-cultural aspects accompanying them and use it to achieve personal and professional objectives. In her study, Candel-Mora (2015) finds out that developing intercultural competence serves as vehicle to learn languages and accept the engagement into international interactions using languages other than English. Fantini and Richards (1997) believe that exposure to diverse languages, cultures, and world perspectives cultivates the development of awareness, attitudes, skills, and knowledge required by individuals to active and effective participation and empathy with others in both local and universal arenas (as cited in Nicolaou & Sevilla Pavón, 2022).

To sum up, ESP practicality is the ultimate goal of the whole branch. It intends to push the learners to communicate effectively using the target language frequently in their field of study and future implications in the workplace. Although it differs from other ELT trends, it focuses on practical outcomes such as communicating effectively through their study or work tasks.

Table 2

Some Typical Characteristics of ESP and EGP Courses

ESP	EGP
Adult learners	Any age learners
Learners have a common goal	Learners have a wide range of goals
Learners have high external motivation	Learners have a range of motivation
Are short term	Are long term
Based on needs analysis	May not bear in mind student needs
Have an academic, professional or workplace focus	Have no specific focus
Have specific content	Have general content
Are based on specific target communication	May include limited exposure to target communicative events
Learners usually have a basic command of English	Learners may be at all levels, including absolute beginners
Focus on specific lexis	A full range of lexis is included
May have a limited focus on grammar	Usually incorporates the full grammatical system. This may be the central organisational strand in the syllabus
A limited range of skills taught – for example, writing and speaking	All four skills are taught with equal focus
ESP courses may be taught with methodologies relevant to the content field	Methodology tends to be similar across courses adopting current thinking in English-language teaching in the region

(*Note.* Adapted from Woodrow, 2018, What is ESP?)

1.8. Types of EAP

Panigrahi (2018) states that an "integrated approach exposes English language learners to authentic language and challenges them to interact naturally in the language not only in the English classroom but also in other subject classrooms like mathematics, science, social studies, geography etc" (pp. 542- 543). He gives two reasons for this assumption. First, through this teaching approach, learners quickly acquire a genuine understanding of the richness and complexity of the English language when used for communication. Second, this method emphasizes that English is not only something to be studied academically or just for the purpose of passing exams, but rather a practical tool for people to interact and exchange ideas with one another. Parkinson (2012) affirms that "the wide range of purposes and contexts in which English is used has made English for specific purposes (ESP) an eclectic discipline" (p. 155). According to Rao (2014), English is generally viewed as the lingua

franca of international business, economy, science and technology. Based on St John's (1996) assertion, ESP consists of "English for Science and Technology, English for Business and Economics and English for Social Sciences, each with an EAP and EOP division" (p. 3).

1.8.1. English for Science and Technology (EST)

History and Significance of EST

Historically speaking, Ortiz (2006) maintains that initially the emphasis was mainly on the USA as it was the sole industrialized nation with its preserved educational and technological infrastructure after the end on the Second World War. Johns and Dudley-Evans (1991) believe that one of the drives in the globalization of ESP was "the explosion of scientific and technical English (EST) especially in professional publications and graduate schools" (p. 302). They point out that the majority of the journals concerned with physics, chemistry, biology, medicine and maths are written in English language. EST international and local seminars and meetings become very popular.

Howcroft (1999) affirms that "the English language has also come to dominate the world of science and technology. Most research work is now published in English no matter where the research was carried out" (p. 26). She affirms that this area of study was designed for adult learners and is primarily directed towards non-native speakers of English individuals pursuing higher education in science and engineering. As per Assassi's (2020) view, the mastery and use of English as a lingua franca provides opportunities for professionals and academics with various linguistic origins to exchange their ideas to an extensive audience and to support the development of scientific knowledge. Mike Robinson (1994) sustains that "science, technology, engineering and mathematics (STEM) are usually singled out as the most pressing educational areas" (as cited in Howcroft, 1999, p. 14).

Because of the great development in science and technology after the Second World War, EST appeared in the 1950s. Rao (2014) considers EST as a subfield within the broader

discipline of ESP and of great importance for engineering and technology institutions. Li and Li (2015) depicts EST as referring to "English used in scientific publications, papers, textbooks, technical reports and academic lectures, etc … to describe the physical and natural phenomena, their processes, properties, characteristics, laws and application in productive activities" (p. 161). Based on St John's (1996) statement, "initially EST and EAP were the driving forces in ESP and practice was rarely research led" (p. 4).

Language of EST

Robinson (1994) believes that the most effective way to secure the national common good is to educate a technologically competent workforce, which would help to preserve America's declining technological benefit in the global economy (as cited in Howcroft, 1999). Howcroft (1999) guarantees that individuals studying English or working in the field of science are likely to encounter the technical English used in computer technology, multimedia applications, electronic mail, and the Internet. She adds that the predominant software and computer communication systems, such as the Internet, originate from the United States, and hence, they are typically developed and managed in English.

Li and Li (2015) affirm that "due to its main functions of statement, description, exposition, definition, classification, instruction, comparison, exemplification, inference and reasoning, EST has achieved its own language characteristics that contribute to the formal, concise, precise, impersonal and economical style of scientific documents" (p. 161). They state the following set of the lexical, syntactic and rhetoric aspects of EST to enhance the effectiveness of EST communication. First, the precise and technical nature of ST materials is expressed through the skillful use of lexical characteristics in ESP, such as the frequent use of ST vocabulary (complex in formation, meaning and use), replacing verb phrases with formal verbs (colloquial and synonymous VS formal and monosemous), and using abstract nouns and

descriptive adjectives (expressing the methods, existence, instruments, and outcomes of actions).

Second, EST documents attain precision, conciseness, and impartiality by utilizing certain syntactic features, such as wide use of postpositive attributives (prepositional phrases, adjectives/ adjective phrases, adverbs, particles, attributive clauses, and compound combinations of the previously mentioned items), non-predicative verbs (taking these forms: the Infinitive "to + V", the Present Participle or the Gerund "V-ing", and the Past Participle "V-ed"), passive voice (meeting the objectivity, compactness and coherence as the EST requirements), and lengthy and complex sentence structures (conveying interrelated and paradoxical relationships between living things in nature through mutually conditioned clauses and phrases in long complicated sentences).

Third, EST can improve its documents objectivity, conciseness, and logical flow by employing rhetorical aspects, including the restricted use of tenses (mainly simple present and simple past to express timeless notions), simple rhetorical devices (stating facts and laws directly rather than through literary phenomena such as metaphors, personifications, etc), frequent use of unusual sentence structures ('omitted items in sentences, inversed subject-verb order, or fragmented sentences containing pauses and breaks inside), and intentional implementation of subjunctive mood (prerequisites and conditions for depicting common sense, suggesting ideas, discussing problems, and deducing formulas) and imperatives (giving instructions, suggesting, advising, etc). Li and Li (2015) conclude that "the characteristics of EST also exist in ordinary or literature English but become more prominent in EST" (p. 165).

Zaro Vera and Truman (1999) affirm that scientific and technological texts use specialized language and terminology that are specific to their respective disciplines, reflecting their highly specialized nature (as cited in. Hutchinson & Waters, 1987). Musikhin (2016) declares that "as the language competence needed by scientists and engineers should

be related to their professional area, a language learning approach should be based on the activities that are relevant and typical to their profession in an international context" (p. 29). He believes that a language learning program must improve these learners' language skills along with their comprehensive awareness to empower them to communicate efficiently with colleagues of different origins.

1.8.2. English for Social Studies (ESS)

Nature of ESS

The field of social studies is interested in "teaching students about people, their activities, and their relationship: cultural, social, economical, and geographical" (Musdalifah, 2021, p. 258). It encompasses the disciplines of sociology, languages, history, religion, fine arts, politics, economics, psychology, and media studies. Özbaş and Güryay (2014) declare that "English language and social studies lessons play an important role in teaching global citizenship, global awareness and connections" (p. 1132). They clarify that social studies is an educational curriculum that is interested in investigating how individuals and communities coexist in the present and in the past

According to Cruz and Thornton (2009), the field of social studies comprises three fundamental components: "traditional academic subjects (e.g. history, economics), branches of learning developed for instructional purposes (e.g. civics, global studies), and current events and problems" (as cited in Özbaş & Güryay, 2014, p. 1133). Expanding upon earlier research, Wright-Maley and Green (2018) emphasize the necessity for teacher training and professional development in order to prioritize the development of skills necessary for teachers to effectively bridge the gap between language and content learning in the social studies context.

Characteristics of ESS

Swaan (2001) states that English as the language of the social sciences and humanities is different from English as the language of science and technology. He lists some of those differences. First, while the natural sciences use formal and quantitative terms, as well as precise measurements, the social sciences and humanities must achieve the same level of precision by using natural language with thorough accuracy. Technical terms often overlap with everyday language (such as "role" or "class"), resulting in writing that is both ambiguous and rich in meaning due to the interaction of different spheres of meaning.

Second, unlike English in the natural sciences which can be expressed in both ways, the social sciences are less able to convey their insights about the social world through mathematical language, formal structures and visual representations.

Third, translation is another difference. It poses significant challenges in the social sciences. In contrast to natural sciences, the process involves several levels starting with the need to convert the language into the formal language of academic writing. In addition, it has to use an international language of academic discourse. This requires finding English equivalents for terms that refer to specific traditions, mentalities, and institutions of the society under study. The translation process can be further complicated by the presence of words and phrases that are unique to the culture being studied and have no direct English equivalent. However, translation benefits at conveying a culture's exceptionalism. Ortiz (2006) supports this concept as the social sciences are deeply connected to specific contexts, and consequently, making the universalization of their discourses a difficult task. He insists on the comparative method, shifting from general theory to deduce any existing relationships in reality because "the social scientist does not count on a laboratory to make experiments". According to Swaan (2001), stating the difficulties lying in the social sciences assists teachers at making the students aware of issues matched to translation and developing their observation and comparison skills.

Ortiz also takes the contrast between the social and natural sciences further. Drawing on the insights of some scholars, he argues that, in natural sciences, magazines are considered the primary sources of first-hand information provided by researchers and laboratory teams for immediate publication. There is no long time gap between existing knowledge and upcoming discoveries, making them the ideal medium for ongoing scientific research. In the social sciences, the knowledge and documents become outdated at a slower pace as they depend on the interpretation of data and phenomena rather than merely presenting information. This process necessitates time.

Dominance of English in Social Sciences Publications

Swaan (2001) affirms that "the hegemony of English in the social sciences (and in other fields) has yet another consequence that is mostly ignored. Academics are required to publish regularly in 'international' and 'refereed' journals" (p. 143) which are generally American and British periodicals. This status of English has been criticized by some scholars and admired by others. The advocates of this situation argue that there exists a single organized global forum where the credibility and legitimacy of social science assertions can be evaluated through appointing "editors and referees that are accomplished but not native speakers of English" (Swaan, 2001, p. 144). This provides a unified standard that is globally accepted to assess the quality of research in this field. Its opponents, such as Pierre Bourdieu, believe that teaching English should be done in a way that encourages critical thinking and analysis rather than adopting and accepting American and British ideas and practices. Moreover, learners should view English as a tool to convey their own ideas and perspectives and to be open to the richness and diversity of different cultures and languages.

1.8.3. English for Business and Economics (EBE)

Evans (2013) declares that "most consumers of BE [Business English] courses are students at senior secondary or tertiary level or white-collar workers and are, therefore, likely

to have studied General English for many years at school" (p. 292). He believes that although the designed BE class activities can never reproduce the 'conditions and complexities' of the current workplace, they would nevertheless contribute at bridging the gap between the office and classroom through motivating students to learn by practical and interesting experiences. English for Business Purposes is commonly known as Business English (BE).

English for Business Purposes: A Lingua Franca

Manyika et al. (2016) assert that "twenty-first-century globalization is increasingly defined by flows of data and information" (p. 1) and has resulted in the world becoming "more intricately connected than ever before" (Manyika et al., 2016, p. 1) "by commerce, communication, and travel than it is today" (Manyika et al., 2016, p. 2). House (2012) portrays English as a default medium of communication among people with different linguistic and cultural backgrounds (as cited in. Roshid et al., 2022). English for Business Purposes, the focus of the current research, is a sub-branch of ESP which has appeared in the modern era.

English as the Business Lingua Franca (BELF) is defined as being "similar to English as a Lingua Franca (ELF) in that it refers to the use of English as a shared language by speakers of different mother tongues in interpersonal encounters" (Kankaanranta & Louhiala-Salminen, 2014). It is useful in business communication and enables students to participate in international business workplace. It trains learners to adopt intercultural competence so they accept the differences of those from different cultural and linguistic backgrounds. Ehrenreich (2010b) compares and contrasts English as a Native Language (ENL) and BELF. She defines BELF as a language that is 'nobody's own'. In this definition, she agrees with Louhiala-Salminen and Charles (2006), when they state that BELF can be shared and "is used in the business discourse community" (pp. 31-34). According to Assassi (2021), mastering English as a lingua franca helps "scientists from different linguistic backgrounds to put their creativity

and contribution into the international display" (p. 439) and hence, allows sharing ideas and contributes at developing knowledge to the global communities of academicians and professionals.

Ehrenreich (2010) conducts a study about English as a lingua franca in the field of business. She finds that the status of English "as the de facto lingua franca of international business is undisputed" (p. 417). Her study participants agree that all workers ranging from employers to regular office workers must learn and use English in all settings. She also concludes that English has become 'a must' for hiring job candidates with more focus on technical expertise than on English language proficiency. Roshid et al. (2022) depicts the current use of English in business as "English as a Business Lingua Franca (BELF) is used in both spoken and written communication and underpinned by the paradigm of English as a Lingua Franca (ELF)" (p. 83). In addition, they declare that communication technology progress implies the incorporation of a wide array of forms of communication "such as synchronous face-to-face conversation, telecommunication, web chat, and asynchronous e-mail communication and document sharing and contacts" (p. 84).

For Ehrenreich (2010), Business English as a Lingua Franca can be developed by engaging students through exposure into real situations where mutual interactions with 'international colleagues' and 'business partners' on one hand and through language training on the other hand. Roshid et al. (2022) base their ideas on the insights of many BELF researchers and list some examples of contextual aspects of BELF discourse among which are those mentioned by Kankaanranta and Planken (2010): "the shared business domain, the shared professional expertise and the extent of organizational rapport" (p. 85).

The emergence of English as a lingua franca for international business within the globalized economic arena has urged an intensified demand for a variety of Business English (BE) courses (Evans, 2013). These courses point fundamentally toward enabling students to

communicate effectively using English in a more and more globalized workplace. They are tailored to suit learners' age, proficiency and communicative context (Evans, 2013) and their readiness and motivation towards the teaching methods, selected materials, and the instructional techniques (Lindsay, 1977). As a result, a wide range of English textbooks and teaching works have been published by university and commercial companies. They provide a bulk of materials related to real business situations on one hand and authentic in their input and tasks. In this vein, exercises instruct learners to match phrases, write true or false, fill in the gaps, and other traditional activities types. In this period, Evans (2013) affirms that "design of materials owed more to intuition and introspection than to investigation" (p. 282). Then, research has been held to find out communication tasks occurring at workplace through conducting surveys, interviews and case studies and make recommendations for tasks and course designers based on pedagogical information. Louhiala-Salminen (2002) conducts a day-in-the-life case study and focuses on text types and speech events where managers use English at work (as cited in Evans, 2013) such as report writing, formal/ informal meetings, telephoning, job interviews, etc.

Considerations for Teaching English for Business Classes

Incorporating Hymes' insights, workplace communicative competence is defined by Jenks (2023) as acquiring "aspects of communication that are essential to workplace English, such as understanding how to operate within, and flout, setting-specific rules, and the ability to accommodate recipients and design utterances according to different pragmatic needs" (p. 1). He argues that it requires the acquisition of the interaction skill with interlocutors considering context aspects such as the media of communication, degree of formality of the situation and social roles. He compares it with pragmatic competence and asserts that the latter implies that "learners must be able to use language in context-specific ways and possess an understanding of socio-cultural norms and conventions" (pp. 3-4). He goes further to

distinguish between pragmatic competence and interactional competence. Although he finds that they seem similar looking at the aspects of language and communication they encompass, he also states that they have some differences: first, drawing on the concepts of Young (2011), Kramsch (1986) and Celce-Murcia (2007), the interactional competence includes skills that are not covered by pragmatic competence such as turn taking. Understanding these competences assists instructors to design more effective teaching materials, for instance, providing courses on pragmatic knowledge (e.g. politeness rules) compared to offering opportunities for learners to practise interactional skills (e.g. turn taking).

Second, Jenks (2023) uses Young's (2011) perspective on pragmatic competence involving intrapersonal skills compared to the interactional competence requiring interpersonal skills. In other words, the former refers to a person's knowledge of how to communicate effectively, which is or is not likely to be conveyed to others who use the same language. Conversely, the latter uses pragmatic meaning in a specific discourse by everyone participating in communication. This distinction benefits teachers to include both teacher-led lessons and student-centered activities.

Third, Jenks (2023) builds upon the idea of Markee (2008) that interactional competence is a redefinition of conversation analysis which employs skills investigated by conversation analysts like turn-taking and recipient design. This implies knowledge of conversation analysis principles in order to improve interactional competence in the workplace.

Business Communicator's Skills

Assassi (2021) suggests that "joining the international community on a professional level can provide the job seeker with more opportunities when mastering the language or even having efficient communicative skills" (p. 439). St John (1996) states that "being an effective business communicator depends not only on verbal language proficiency but also on personal

and interpersonal skills" (p. 8). He considers linguistic issues as well as personal and interpersonal communicative skills which a proficient business communicator needs. Attempts to set up agreed on technical lexis and grammar related to business language are founded out of the results of ongoing research using needs analysis, text study and specialist informants. St John (1996) believes in "the importance of spoken language for those using English in business settings" (p. 6). Pickett (1986) describes business English as resembling everyday English used by common people rather than being specialized ESP language (as cited in St John, 1996).

For non-linguistic aspects needed by business communicators, St John (1996) mentions communication strategies, status relationships and cultural diversity. Speakers choose from a range of language forms and vocabulary choices the suitable ones for the situation using their interaction tactics. They make decisions about the appropriate length of a turn and timing of an utterance to communicate effectively depending on factors including the objective of the meeting, the size of the attendees along with their positions and interrelationships, cultural affiliations, etc.

Instructional Content and Materials of EBP

St John (1996) states that "the suitability of the [teaching] material is not universal" (p. 9). He divides them into four types according to linguistic skills matched to each work environment. First, *'business communication skills'* are vital for effective communication in all areas of life, and they expand to include not just verbal language, but also organizational skills, non-verbal language, and audience awareness. Second, '*business contexts'* category comprises hard-core ESP materials that are discipline-specific, such as finance and marketing, and relate to the nature of the business and its interactions. Third, '*business studies methodology'* acknowledges that ESP practitioners adapt their teaching approaches according to their students' learning experiences and nature of the field of study, e.g. case studies and

simulations are the most commonly employed. Case studies engage students in real-life business scenario or problem such as declining sales in a company, and instruct learners to analyze and address the issue implementing the appropriate business vocabulary and concepts covering business activities, management, and entrepreneurship. The last category called '*language in business settings*' is closely related to EFL materials and a fundamental component of English for General Business Purposes (EGBP). The latter refers to teaching English language skills and knowledge in a variety of business-related contexts such as negotiations, meetings, presentations, etc.

Thavabalan et al. (2022) claim that "today's educational credo is to "produce employable graduates who can see beyond the horizon"" (p. 63). Thus, business English courses and curricula have to be constantly updated. As put forth by St John (1996), "demand for Business English has burgeoned in recent years and there has been a mushrooming of courses for learners, courses for teachers, materials for learners, and reference material" (p. 3). Chan (2023) points out that "one of the biggest challenges for teaching business English at university is the lack of authentic texts and updated information on workplace genres" (iv). He depicts the fact that the majority of business learners are still learning from textbooks which have little relationship to the current features and genres of workplace texts. He attempts to find out the factors affecting workplace communication including the emerging innovations in the 21st century technological landscape.

1.9. Types of EAP Courses

EAP is typically offered in various environments, which can depend on the learners' educational level (Woodrow, 2018). Woodrow presents types. Firstly**,** foundation EAP courses or direct-entry courses target upper high school students and imply teaching both the fundamental concepts and skills required in a specific academic subject and the language skills related to academic contexts. They are full-time and offered in the students' home

country, in the hosting country where undergraduate studies are to be pursued, or a combination of both.

Secondly, pre-sessional EAP courses are language and academic preparation courses that full-fee-paying international heterogeneous groups of students frequently take before starting their academic studies. They typically focus on English for General Academic Purposes (EGAP) involving various communicative situations. They aim to provide students with language instruction and academic skills for succeeding in their studies.

Thirdly, in-sessional courses can be voluntary or compulsory and are taken by students to improve their language proficiency and academic skills while simultaneously pursuing their academic studies. Students can enroll in these courses depending on their performance in language tests determining their weaknesses in academic communication.

1.10. Indicators of Effective Teaching in ESP Classes

Basturkmen (2010) gives some features which make ESP classes effective in terms of output. She contends that ESP courses are more effective than general ESL courses as they have more specific and limited objectives. Similarly, Woodrow (2018) affirms that ESP learners "usually have common goals and is arguably more highly motivated" (ESP learners are goal-driven). Additionally, they are grouped according to their specialization rather than their language level from beginner to advanced levels. Therefore, this forms mixed ability classes which influence the materials selection and initial hypotheses about needed knowledge by learners.

Moreover, Woodrow (2018) argues that needs analysis in ESP classes shows the necessary skills required for a target communicative situation, instead of making grammar the main focus of the courses. In the same vein, Basturkmen (2010) agrees that "because ESP courses cater to students' interests and needs, they are more likely to engender high levels of motivation" (p. 11). She assumes that students are likely being more engaged in topics and

texts that are relevant to their work or studies, and hence, they are expected to learn and retain information efficiently.

Additionally, Basturkmen (2010) concurs with Lave and Wenger's theory (1991) that learning is a social process, which entails active participation in a 'community of practice'. This group of people sharing similar concerns, interests and problems enhance their knowledge and skills in their target area through their interactions with one another. This would ensure continuity which is approached from a different perspective by Woodrow (2018). ESP practitioners intend to ensure continuity throughout the entire course, so that they can build on the knowledge and skills that have been covered in previous sessions to move on to new material or concepts, instead of isolated programming isolated grammar forms. This aspect stands in contrast to EGP standard staging of the lessons.

Another point Woodrow mentions is the relationship between ESP teachers and learners. Rather than serving as language experts, ESP practitioners are expected to possess the requisite disciplinary-specific knowledge in students' field. Further, Woodrow considers that each discipline within the sphere of ESP has its own prevailing methodologies, which can be adapted for use in the ESP classroom. She introduces the example of problem-based learning for medical studies and a case-study approach for business students.

Ultimately, Woodrow (2018) describes an ESP practitioner's characteristics. Insufficient training in ESP for practitioners moving from EGP to ESP can pose significant difficulties for both the instructors and the courses they teach. The teaching of ESP can be enhanced when practitioners acknowledge their expertise in English, skills and other areas of expertise with openness to learning about the subject matter rather than the subject itself.

1.11. Challenges for ESP Teaching in the 21st Century

Bhatia et al. (2011) have discussed the challenges facing ESP in the current time in the coming points. First, ESP today prioritizes obtaining a professional knowledge by

combining communication skills, academic knowledge and occupational practice meanwhile considering the mastery of complicated and ever-changing social and pragmatic features of the discipline-specific communicative setting. Consequently, those authors believe that the paramount obstacle for ESP is "to bridge the gap between the classroom and the world of work, and understand the relationship between ESP classroom discourses, professional discourses, and professional practices" (Bhatia et al., 2011, p. 144).

Second, the role of ESP teachers in designing courses in collaboration with content specialists, teaching, select or create the appropriate materials and evaluate the progress of their learners is difficult to implement in practice. Only a few number of ESP practitioners possess enough time and required experience to do these tasks. This arises from ESP practitioners being in charge of teaching students from various specialist fields, and hence, being generally preoccupied by looking for previously published ESP materials which can be suitable for each field of study. To enhance the implementation of ESP and avoid challenging ESP practitioners with "multi-tasking" and "multi-functioning", Bhatia et al. (2011) suggest that "the work of creating and implementing ESP courses can be divided among faculty, with individuals working on smaller, easy-to-complete tasks" (p. 145). In other words, ESP is placed in the core of an English program using all resources and engaging all staff of the faculties.

Drawing on the insights of many scholars, Bhatia et al. (2011) address another issue in ESP. The English level of ESP students required to master needs to be determined. They conclude that learners should focus in the first place on learning general English as what is called 'the native-speaker model' is not the ultimate objective in ESP classes. Those authors think that the reasons for this situation are related to the impossibility of studying what Halliday, McIntosh and Strevens (1964) called 'whole language' (as cited in. Bhatia et al., n.d.) taking, for instance, a science and technology student who has no need in literature

register. Another cause Bhatia et al. (2011) cite is the emergence of World Englishes and English as an international lingua franca. This is viewed as an advantage by Alptekin (2010). The latter describes the users of English as a lingua franca as multicompetent through their awareness of the varieties of languages and world culture.

Equally important are "the problems associated with obtaining information through the Internet" (Howcroft, 1999, p. 23). The first challenge emerges from determining the precise source or location of the desired information among the huge amount of digital resources and materials. The second obstacle stems from finding the exact key words to be typed in the search engine to get no more and no less of the needed results within a reasonable time frame (Howcroft, 1999).

1.12. ESP in the Algerian Higher Education

Effective communication among international colleagues sharing the same research interest is of great importance for the advancement and development of any field. To that end, English is used as a lingua franca to become a part of the international community. The academicians and professionals are not an exception. University students are increasingly employing English to prepare their dissertations, write articles and participate in conferences.

1.12.1. Status of English in the Algerian Higher Education

Until recently, French has been given priority over English in the educational, occupational and administrative domains in the Algerian context (Assassi, 2021). This was because of the historical colonial heritage of France. In addition, in the aftermath of the Algerian independence, Algeria has developed a close relationship with the Soviet Union instead of USA during the 1960s till 1980s. Nevertheless, the emergence of USA as the superpower and English as an international language, French is still there to dominate in the Algerian educational system along with continuous efforts of arabization of the country.

In the very recent past, however, university instruction and courses are gradually shifting from being French or Arabic or both in some branches to become purely English through government political initiatives. This has been an attempt to reform the higher educational system to comply with the universal academic and professional policies and actuatlities. In addition, the desire of the learners to seek better workplace opportunities is increasing. The most recent move has been the Minister's correspondence for the universities to offer training in English for all teachers in all institutions. This step aims at improving the quality of Algerian higher education, research and high-impact publications and journals reviewing and matching it to the globalized world.

Calls for reform have been fruitful in promoting the status of English as a foreign language in Algeria. Recently, there has been a notable emphasis on prioritizing teaching English at the expense of French in Algerian political decisions. The Ministry of Higher Education has issued a decree under the terms of which English has become the medium of instruction in the Algerian universities. Moreover, it has instructed university directors to hold meetings before the summer vacation to organize the process of teaching in the English language during the upcoming academic season of 2023-2024. In pursuit of that aim, the ministry has implemented an intensive program that provides training in the English language for the pedagogical teams according to the discipline during the last trimester of the university year 2022-2023.

Although Algeria has integrated educating English in all educational levels, ESP is still abandoned. Assassi (2021) has precisely depicted this situation as follows

> Algerian universities do not offer adequate specialised ESP courses. This might not be an accurate estimation of the ESP situation in Algerian universities. However, the fact that ESP courses are assigned randomly to undergraduate students of English [to teach it] and without any fixed syllabi, in addition to the

> lowest credit and coefficient allocated to ESP courses in comparison to specialty modules, makes students from different specialties take this course for granted. This leads to neglect the fact that English is one of the main factors affecting intellectual, social and economic development. (p. 441)

Therefore, a gap exists between the positive fostering trends in policy makers' rhetoric and the real status of ESP integration in the Algerian context. The national time frame devoted for English as a required course is one session per week with an average of one hour and half per session in the Algerian universities for undergraduate and postgraduate students belonging to fields of study other than English major.

1.12.2. Algerian ESP Teachers

Algerian ESP teachers commonly perform various tasks and assume different tasks stated by Boudersa (2018) such as "designing courses, developing materials, evaluating materials and so on" (p. 1) although specialization in the field is preferable. Moreover, Boudersa (2018) contents teachers of English at university are frequently neither prepared nor received any training in ESP.

1.12.3. From Teaching ESP to English as a Medium of Instruction: Motives

In an effort from government to enhance the quality of higher education, English has been made the medium of instruction. In addition, the current globalized world has imposed conditions and skills to be acquired by competitive university graduates.

Algeria is now moving from teaching ESP to the use of English as a Medium of Instruction (EMI). Drawing on the insights of other scholars, Vavilina (2020) affirms that the change in equilibrium between content and language in ESP programs showcases a transition in the emphasis placed on the subject matter and the language aspects within the course. This can be identified in two factors. First, there is a shift towards subject-focused instruction, meaning that teachers prioritize teaching the subject matter itself. This leads to an increase in

task-based activities. Aiming at fostering active learning and practical application of knowledge, learners are involved in hands-on tasks or projects matched to the subject matter. Second, learning content through a foreign language entails simplifying educational process through supplying students with personalized tools and resources mainly digital ones.

Conclusion

To give an overview, English has dominated the international scientific research and publications, social sciences representative, and economics and business. So, English for Specific Purposes has emerged to enable individuals from different nations to communicate effectively with each other. For that end, educational programs and courses in these disciplines prioritise teaching language proficiency and develop cross-cultural interactions. In addition, they are directed for adult ESP learners who have certainly witnessed different experiences which may have positively or negatively affected their learning attitudes. Thus, enough data should be collected about these students' background, preferences, and expectations so that effective courses can be designed and developed.

Chapter Two

Chapter Two: ESP Course Design

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Introduction

Based on Ignjatović's (2020) assertion, ESP course design is distinguished by two features compared to ELT: "Authenticity and ESP-specific methodology, which ensure authentic learning for specific discourse community purposes" (p. 184). To that end, he adds that ESP learners are introduced to "authentic discourse community contents, genre-specific texts, communicative competences, and discipline-specific practices" (p. 184).

Course designers need fundamental skills and knowledge to be academically and practically empowered at developing courses and curricula. In ESP, course design implies creating courses from the initial stage of identifying needs to the last one of evaluation and assessment. As put forth by Woodrow (2018), ESP courses prioritize the needs of the learners and other invested parties, including educational institutions and employers.

Nevertheless, Hyland (2006) points out to the fact that "teachers may not always have complete freedom to choose what their courses will include, and may find their syllabus handed to them by administrators or prescribed in set texts" (p. 81). In such cases, he suggests that educators can draw upon their own expertise and individual convictions towards language teaching-learning during course development and implementation. He believes this would impact the quality of the designed syllabus as well as learners' involvement and participation in this process. This research looks for the course design perspectives which lead to creating successful and captivating learning environments.

2.1. Course Development and Presentation Considerations

Basturkmen (2010) categorizes courses as either "wide-angled" or "narrow-angled." "Wide-angled" courses like EGAP and Business English are designed for a broad group of learners and cover general academic skills or registers such as Business English, which includes multiple subfields like marketing, accounting, and management. Conversely,

"narrow-angled" courses are designed for learners with specific needs and a particular academic or work environment in mind, assuming a level of homogeneity among the learners.

Basturkmen (2010) suggests that there are some potential drawbacks associated with highly specialized courses. The first point, the assumption that highly specific courses are motivating for learners due to their relevance may not always hold true. Students may switch courses and workers may change jobs and roles. As a result, only a few individuals from a narrow-angled ESP course may end up studying or working in the intended situations. Secondly, this type of courses offer a restricted language scope, limiting learners to surface-level linguistic forms for specific situations, and hence, does not develop a deep understanding of language and encourage creative language use.

Next, there will be logically variations in the course content and its applicability to different students when there is improbability of identical needs in narrow-angle ESP courses.Another argument is the impracticality for any single ESP course to comprehensively cover all roles and areas of specialization existing in particular workplaces and academic programs.

Last but not the least, ESP teachers and course developers of highly specific courses necessitate extensive research and preparation to examine the discourse and communication norms within a particular discipline or workplace, and additionally limited access to workplaces and time constraints of busy professionals causes challenges for discussing language use and communication.

2.2. Factors Affecting the Effectiveness of ESP Course Design

Woodrow (2018) highlights specific concerns that should be addressed before designing a course. She differentiates between ESP learners and EFL ones. Unlike ESP learners' typically voluntary attendance with already predetermined goals, EFL learners are obliged to attend classes. This may make them disregard the value of English and feel

unmotivated to study it. However, this inconsistent attendance lessens the amount of time needed to support students who are most at risk of falling behind in language acquisition. Next, ESP learners' professional responsibilities can diminish interest in English courses. Additionally, the level of their engagement can be influenced by the tension between the content of the subject matter and English language in ESP settings.

In addition, Basturkmen (2010) sheds the light on other factors affecting the efficiency of the course design. She compares the needs collecting works of Ferris (1998) on ESL students and faculty members on one hand and Kim (2006) with East Asian graduate students at a US university. She observes that the studies produce contrasting results. The key takeaways from her analysis can be summarized in the following points. Initially, the needs of graduate and undergraduate students in speaking/discussion can vary, and relying on memories may not be the most reliable source of data. Preferences of instructors can also differ over time; next, focus should be put on identifying necessary skills, students' perceived difficulties, and critical skills for academic success, and hence, a clear guidance is provided to the development of an EAP course that addresses students' specific skills needs and perceived difficulties; further, a discrepancy can appear between professors' and students' perceptions of requirements and difficulties. Therefore, ideas on needs may imply to be gathered from both parties during the needs analysis process.

The effectiveness of course design through needs analysis is highly dependent on the usefulness of the information gathered. In the view of Basturkmen (2010), the selection of appropriate data collection techniques is a significant factor in ensuring the quality of the data collected during needs analysis. She presents Kumar's (1996) discussion of the advantages and drawbacks of the most used needs analysis tools: questionnaires and interviews. Per his assertion, questionnaires are quick to administer and can collect data from a large number of respondents. The latter' anonymity allows them to express their views and ideas freely and

honestly. Interviews are time-consuming, but they present the advantage of probing for in-depth responses and explain ambiguous answers. However, both methods have potential shortcomings, such as study subjects offering idealized or unrealistic responses in questionnaires and risk for interviewers' bias through their personal opinions.

2.3. ESP Course Design Framework

Charles and Pecorari (2016) assert that "much of the success of a course depends on what happens before teaching starts" (p. 60). In other words, having a comprehensive understanding of the planning process enables effective decision-making about conducting a needs analysis, setting learning objectives, selecting suitable content, and application of knowledge and skills from multiple interconnected disciplines. In brief, the process of planning a course enables teachers and course designers to make well-informed decisions about their choices and create well-designed courses within the predetermined conditions.

Figure 4

The Four Pillars of ESP

(*Note.* Adapted from Anthony, L., 2018, p. 46)

The ESP practitioner has to collect data about the learners' present strengths and weaknesses in English proficiency, learning objectives of their major (types of genres for

learners to produce and participate in), required classroom materials (a ready available textbook to be used, handouts, worksheets, …) and methods (employing individual, pair work, and group activities), and finally, evaluation and assessment of learners' goals achievement, teacher's performance and the materials efficiency (Woodrow, 2018). "the complex tasks of designing, implementing, and evaluating an ESP course or program will be shared among the members of a team, each person making a contribution based on their own area of ESP expertise" (Anthony, 2018, p.37). These pillars of ESP are highly important for designing and teaching valuable courses and programs.

2.3.1. Needs Analysis (NA)

Woodrow (2018) states that "in ESP the learner is at the centre of course design. Typically, courses emerge from needs analyses" (Chapter 6: Learning English for specific purposes). According to Basturkmen (2018), the courses of language for specific purposes aim at empowering students with the necessary language to communicate appropriately in specific academic or workplace settings. Hutchinson and Waters (1984) consider ESP as "the best example of communicative teaching in that it is supposedly closely geared to students' needs" (p. 112). They believe that a communicative approach has to be grounded on an in-depth evaluation of students' needs and expectations, an authentic analysis of the ESP learning context, and effective negotiation with the learners. Along the same lines, Woodrow (2018) affirms that the initial stage in the ESP course design process is conducting a needs analysis (NA).

2.3.1.1. Definition of NA

Hutchinson and Waters (1987) affirm "tell me what you need English for and I will tell you the English that you need" (p. 8). Charles and Pecorari (2016) contend that the purpose of conducting needs analysis is to identify the specific skills and knowledge students should have but currently do not possess, and consequently, a needs analysis requires an

initial research entailing information collection and analysis to determine the content and methodology of the ESP course (Basturkmen, 2010). For Motteram (2016),

> Needs analysis is a process whereby teachers, or in some cases learners, decide how the language course should be taught, what topics it should cover and the methodologies to be used in teaching. It should be the precursor to any course and would lead to the development of a syllabus and a number of activities linked to certain types of materials for each session to be taught. (p. 92)

Needs can be interpreted as the causes for which a language is intended to be learnt. This compiles a set of aspects including the learners' purposes, backgrounds, competence level, and motivations for taking the course, favourite educational methods, and target communicative contexts. The learners of English can be stimulated by academic purposes and/ or work aims. Dudley-Evans et al. (1998) give the example of pursuing postgraduate studies with native English speakers as an academic need and using English to take part in business meetings or book in a hotel as an occupational purpose. The focus, then, is on the learners' present academic life and future professional career. Those needs are going to be transformed into learning objectives and be the guidelines for the teaching procedures (Cheng, 2011). Anthony (2018) states, "the starting point of any ESP course is an understanding of the learners' needs" (p. 45). This can be done through conducting 'needs analysis' (NA) before designing or reforming new ESP courses or programs. As for Hyland (2006), NA is defined as

> The techniques for collecting and assessing information relevant to course design: it is the means of establishing the *how* and *what* of a course. It is a continuous process, since we modify our teaching as we come to learn more about our students, and in this way it actually shades into *evaluation* – the means of establishing the effectiveness of a course. (p. 73)

ESP practitioners can ask questions about the educational background of the staff,

their previous exposure to English, their ages and experience, and their general English proficiency. So, a clear vision of the potential faculty's strengths and weaknesses which may affect the course can be obtained.

Table 3

Questions to Be Answered in a Needs Analysis

Learners	What is their first language? What is their age, gender, nationality? What is their level of English? How do they prefer to study? Why are they taking the course? What do they want from the course? What is necessary for them to be successful? What knowledge and skills do they currently lack?
Instructors	How confident are they in English? How much training do they have? How much time do they have to prepare and grade? How many (different) classes do they have to teach? What are their preferred teaching methods? What do they want from the course? What is necessary for them to be successful? What knowledge and skills do they currently lack?
Administrators	What is the organizational structure? Who is in charge? What are their general views of English? What are their views on current instructors, materials, and courses? What are their views of ESP? How enthusiastic are they for change (if change is necessary)? What do they want from the course? What do they consider necessary for the course to be successful? What knowledge about the course do they currently lack?
Setting	What is the target setting? How will language be used in the target setting? How long do learners have to study to reach the goals of the course? What kind of course will be offered (intensive vs. extensive)? How important is the course (credited vs. non-credited)? When is the course run (before, parallel to, or after specialist courses)? Where will the classes be held (e.g. in class, online)? What facilities are available to run the course?

(*Note.* Adopted from Anthony, 2018, pp. 69, 70)

In Basturkmen's (2010) view,needs analysis has grown more complex and refined over time. Her argument is based on the insights of a definition introduced by Chambers (1980) and Dudley-Evans and St John (1998). The first assertion suggests that needs analysis should recognize the communication requirements and how they are met through an analysis of

communication in the target situation. Basturkmen considers the second claim as the contemporary view of needs analysis. To put things differently, the main idea is that needs analysis is a comprehensive process that involves gathering information about the learners' professional and personal backgrounds, current language skills, and expectations for the course. These data are used to identify the learners' communication needs and learning gaps along with effective ways to address these gaps. Additionally, the analysis encompasses an assessment of the target situation and the language and skills used in that context. Finally, means analysis provides information about how the course will be conducted to meet learners' needs and aspirations.

In the view of Woodrow (2018), conducting an appropriate needs analysis depends on the setting of the ESP course. She affirms that academic settings prioritize skills mainly reading and writing. In these cases, needs analysis may not sufficiently involve students due to the rigid institutional demands and requirements which sometimes prefer specific learning outcomes or goals that may not necessarily align with those of the target learners.

2.3.1.2. Needs Analysis in EAP

EAP courses depart from setting clearly the students' main objectives from learning English. This procedure "helps focus the course and make it relevant for learners by taking the world outside the language classroom into account" (Hyland, 2006, p. 73). It suggests that learners are directed towards their future academic life where more than vocabulary lists and grammar structures are not sufficient. Certain personal experiences and social situations have to be emphasized. Currently, EAP courses do not depend on instructors' intuitions as the case was before the initiation of ESP. Instead, they are constructed out of the findings of learners' needs analysis.

However, Hutchinson and Waters (1984) affirm that "the picture we get of 'needs' is much richer and more complex" (p. 108-109) when considering the views and perspectives of

all the concerned parties in the ESP teaching including teachers, institutions, the learners, the society, etc.

Table 4

Kinds of Needs Indentified in Needs Analysis Literature

Ownership	Kind	Source
Learners' needs	Personal needs	Age, sex, cultural background, interests, educational background
	Learning needs	Learning styles, previous language-learning experiences, gap between the target level and the present level in terms of knowledge (e.g target language and its culture), gap between the target level and the present level of proficiency in various competence areas (e.g. skills, strategies) learning goals and expectations for a course
	Future profesional needs	Requirements for future, undertakings in terms of: knowledge of language, knowledge of language use, L2 competence
Teachers' needs	Personal needs	Age, sex, cultural background, interests, educational background, teachers' language proficiency
	Professional needs	Preferred teaching styles, teacher training experience, teaching experience
Administrators'needs	Institutional needs	Sociopolitical needs, market forces, educational policy constraints (e.g. time, budget, resources)

(*Note*. Adapted from Masuhara, 2011, p. 239 as cited in Sutapa, n.d., p. 4)

In the current research, the ESP teacher is not concerned with preparing the course. Instead, it is the responsibility of the researcher. Consequently, oil drilling students' needs are used as a basis for a better understanding of the course takers, context, materials, and interactions. Participants' involvement selecting educational activities and materials is an action research.

2.3.1.3. Role of NA

Basturkmen (2010) claims that the needs analyst is enabled by the needs collection tools to explore individuals' demands, challenges and the importance of language skills and fields of focus. This researcher adds that NA helps at selecting and refining the content of ESP courses. Needs analysis finds out what the learners already can and cannot do in English and the new skills they need to obtain. It also assists in deciding the teaching points to be

included or excluded for the sake of enhancing learners' language proficiency level enabling them to assume the responsibility of their university studies as well as communicating adequately in different contexts. The concepts of 'present situation analysis' and 'target situation analysis' can best summarize all what has been said. Woodrow (2018) contends that the ESP course content is generally designed to address the gap between the target situation analysis which evaluates the necessary skills and knowledge that learners require to function effectively within a specific communication context on one hand and the present-situation analysis that depicts the current communication capabilities.

Figure 5

Steps in Needs Analysis in ESP Course Design

(*Note.* Woodrow, 2018, The Learner and Needs Analysis)

2.3.1.4. Types of Needs

Hutchinson and Waters (1987) divide learners' needs into two types: target needs and learning needs. In target needs, the emphasis is on "what the learner needs to do in a target situation" whereas the learning needs consist of "what the learner needs to do in order to learn" (as cited in Boudersa, 2018, p. 8).

According to Anthony (2018), the "academic needs refer to the needs of learners in a school, university or other setting where the primary goal is learning" (p. 11). He gives an

example of Japanese students having ESP course through listening, understanding and taking notes to English courses and grasp their content and another instance of American universities providing ESP courses to improve academic writing skills of non-native English learners. He also identifies occupational needs as other type of needs and defines them as "the needs of learners in a workplace setting, such as a factory, restaurant, or hospital" (p. 11) having several objectives ranging from improving the presentation skills of the companies' staff to avoiding communication errors leading to catastrophic events.

2.3.1.5. Learners' Necessities, Lacks and Wants

Anthony (2018) states it clearly that "all ESP courses start out with questions about the *necessities, lacks, and wants* of the target learners, as well as questions about the environment in which the learning will take place" (p. 47). To start with *'needs,* they may be matched to the learning methods including issues like class size, timing and length of the course… Another significant aspect in ESP is the '*necessities'*. ESP teachers, course designers, expert informants and future employers depend on their knowledge and experience of a target situation to decide about to the prerequisites and essentials -or *necessities* as already mentioned- of learners' success there. Another ESP element that has been identified is learners' '*lacks'*. The latter is the term given by Hutchinson and Waters (1987) for the gap between the present status of learners' performance in English and their future needs. The last ESP key concept is '*wants'* which is used to describe the learners' desires and expectations from the course.These three concepts cannot be ignored while constructing a course. Otherwise, it can be turned into a failure.

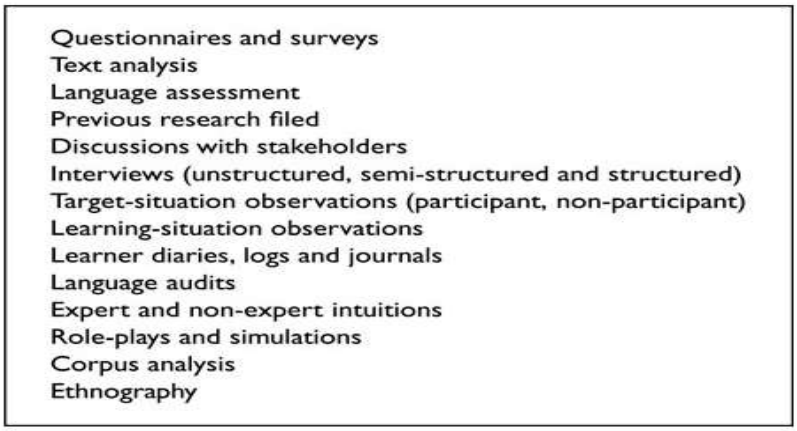
2.3.1.6. NA Tools and Resources

The data about learners' needs can be collected through conducting a questionnaire of learners and/or teachers, interviewing or observing the target learners, reviewing the target field literature, etc. Jordan (1997) mentions that the needs data can be obtained from student

self-assessment, class progress tests and previous research (as cited in Hyland, 2006). Basturkmen (2010) suggests that the existing knowledge can be a source for data to be collected and ways to collect it. She affirms that educators or course developers can utilize the reports on existing courses as a foundation to understand the learners' needs and gather insights on the types of data to collect and the methods for data collection. Hyland (2006) considers authentic written and spoken texts collection and analysis as a rich supply for information about target situations. Basturkmen (2010) argues that "needs analysts also investigate actual samples of language use or learners' performance in events in the target situation" (p. 32).

Figure 6

Some Methods for Collecting Needs-Analysis Data



(*Note.* Adapted from Woodrow, 2018)

Woodrow (2018) gathering data about the needs of learners can be done through "quantitative methods, such as questionnaires, language audits and language tests, and/or qualitative methods, such as interviews, observations and discourse analysis" (Methodologies used in collected data about needs). She also contrasts EAP to EOP needs analysis instruments. The latter usually entails examining real-life tasks by conducting on-site observations and ethnographic research. Yan and Li (2018) claim that more accurate needs analysis can employ a triangulation of big data, cloud computing, and information sharing to

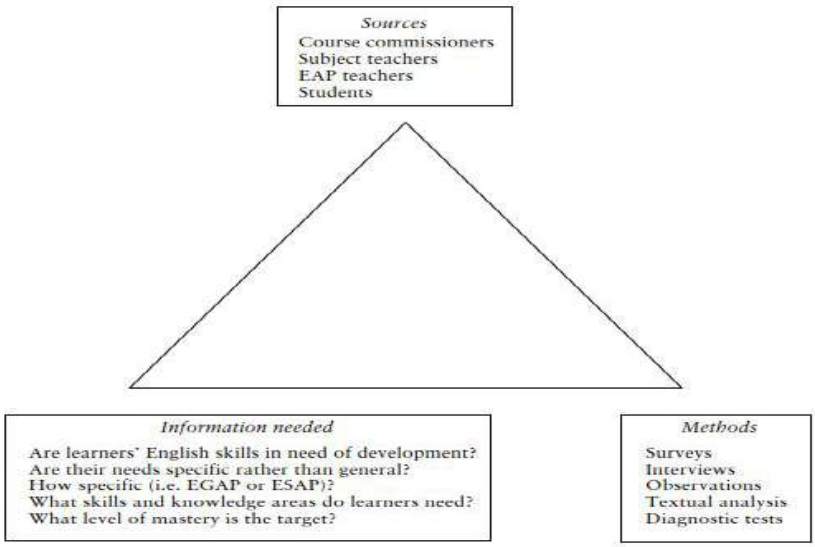
meet the basic concepts of Present Situation Analysis, Learners' Needs Analysis and Target Situation Analysis (as cited in Dou et al., 2023). Needs analysis conduct can use new data collection methods in this digital era. Charles and Pecorari (2016) go further to claim that "where resources are available, multiple methods of information gathering are ideal" (p. 65).

2.3.1.7. Evaluating Needs Analysis Tools

Hutchinson and Waters (1984) claim that "a thorough needs analysis should inform the development of ESP courses and materials" (p. 109). Brown (1989) asserts that NA has to be designed having similar characteristics of a test ensuring its reliability, validity and practicality (as cited in Anthony, 2018, p. 71). In other words, it gives consistent scores whenever repeated, focuses on the target needs only and shows reasonable considerations of the cost and time limits. At the beginning of each course, the learners are asked about the expectations out from learning English, the types of activities helping them to learn better, the period of time they need to grasp the meaning from a spoken or written message and the time to reply. Their answers in this case help to identify their 'necessities'.

Figure 7

Areas of Needs Analysis



(*Note.*Adapted from Charles & Pecorari, 2016, p. 62)

The ESP practitioner has to know about the learners' 'lacks' and the extent of the course success through asking them questions about their ages, educational background, exposure amount to English and their attitudes towards it and their current knowledge in this language. Learners may express their readiness to improve English proficiency through suggesting some ways such as the desire to have a particular training or learn intensively. In addition, ESP course designers may gain a better understanding of the target situation and the learners' requirements throughout putting the course into practice, and accordingly, they modify and adapt the course content (Basturkmen, 2010) .

2.3.2. Investigating the Specialist Discourse

In the view of Basturkmen (2010), before planning the curriculum, course developers and teachers usually require descriptions of the communication and language features of a particular discipline as the needs analysis does not offer sufficient information on the specialist discourse. It is important to base the language content of the course on thorough, precise, and authentic depictions of the ways language is needed to be utilized by learners in their studies or workplace. For instance, a written communication course for nurses requires the ESP instructor or course developer to understand the writing situations and types of discourse involved, including the texts nurses need to write and the features of language use in them.

Basturkmen (2010) states that research on specialist discourse has been conducted focusing on the investigation of text and discourse in ESP, with great significance given to written discourse in EAP and a very little research interest received by discourse and communication in industrial settings. She also includes a set of questions to be asked by ESP practitioners and course designers before designing any course. They need to investigate the necessary language skills, genres, and features required for learners and the possible availability of such information. Based on the insights of other scholars' researches, the

coming approaches to carry out empirical investigations of specialist discourse by ESP teachers and/or course designers.

2.3.2.1. Ethnographies

For Basturkmen (2010), "ethnographies are in-depth and situated investigations, generally focusing on a specific setting such as one programme or institution" (p. 43). The researcher typically dedicates an extended period of time in the setting to collect detailed information about the context, participants, and their interpretations of events, such as their everyday speaking situations. Bhatia et al. (2008) state that ethnography of communication emphasized the aspects that can enable the individuals in a community to become communicatively competent. It goes beyond the linguistic system features to encompass the individual's ability to appropriately use language in relation to the social practices and identities so that the members of the community understand the meaning of several social interactions and activities.

Ethnographic Techniques for Data Collection

This approach departs from collecting data using methods such as "open-ended interviews, narrative accounts, observations and documents as sources of data" (Basturkmen, 2010, p. 44), then involves the researcher in the process of understanding and interpreting the meaning of the events from the participants' perspective. Conversely, Paltridge (2006) proposes that the analyst can either begin by studying samples of the genre and find standard discourse patterns or by exploring the context to understand the genre's functions, values, and expectations within the discourse community that creates it (as cited in Basturkmen, 2010).

Bhatia et al. (2008) name documenting, describing and interpreting social practices through observation and analysis of a record of socio-linguistic behaviours within a particular fieldwork. They also include other more recent instruments such as structured and semi-structured interviews, focus groups, narratives of life experiences of participants in social

interactions or a conjunction of the preceding tools. They add that these procedures would assist ethnographers at understanding language as it is naturally used regarding its socio-cultural settings.

2.3.2.2. Discourse Analysis

Emergence and Definition

Discourse or rhetorical analysis has been led by Widdowson to become a primary movement in ESP during the 1970s. It matches language forms to language use. It explains the way sentences and paragraphs are linked together to produce written or spoken messages. Widdowson gave importance to the latter (usage) including functions such as 'definition, classification and description' over the former like 'cohesion' in an academic text. These features of discourse analysis provide a bulk of information for ESP course and program designers.

Drawing on Widdowson's insights, Johns and Dudley-Evans (1991) argue that discourse analysis "in ESP refers to the examination of written or oral language, generally for purposes of designing curricular materials" (p. 299). That is, they agree on its importance at the selection of ESP class materials. Anthony (2018) introduces the two coming instances. Teachers can employ discourse analysis in EAP to justify the existence of particular connectors, for example, in a specific text type more than others. In EOP, they can resort to discourse analysis for the sake of explaining the high appearance of modal verbs in the polite expressions of telephone operators. In this way, discourse analysis raises the learners' awareness of better use of those language elements in the right spoken or written passages

Bhatia et al. (2008) have presented discourse analysis as consisting of two fundamental elements; first, language can be analyzed beyond its linguistic elements such as phonemes, morphemes, words, sentences to include the text level; second, language has to be analysed with emphasis on the social and communicative purposes and messages it conveys

depending on its context rather than being a set of abstract structures or grammatical rules. According to Bhatia et al. (2008), the advancements in discourse analytical approaches that have given rise to the emergence of various methodologies like register and genre analysis, the ethnography of communication, corpus-based analysis, etc.

Role of Discourse Analysis

Discourse analysis has emerged as a new ESP teaching approach after the critics to register analysis. According to Dudley-Evans and Saint John (1998), it attains the objective of connecting language structure to language use which is the fundamental standard for the selection of ESP teaching materials (as cited in Dou et al., 2023). It also emphasizes extracting meaning from a discourse or specific context, and hence, communication has started to get some concern at this period.

2.3.2.3. Register Analysis

In his article "English as Tyrannosaurus rex", Swales (1997) argues that the spread of English as a dominant language can have negative consequences for linguistic diversity, particularly in the realm of registers. He notes that English has become the default language of many professional and academic fields, which has led to a homogenization of registers within those fields. This means that there is often a standardized, technical register used in these fields that can be difficult for non-native speakers to understand, even if they have a high level of proficiency in English. This can be particularly problematic for individuals who speak English as a second language, as they may struggle to understand the specific terminology and conventions used in these fields.

Role of Regiter Analysis

According to Dou et al.(2023), linguists have created register analysis to “enhance the development of scientific and technical lexis which was hypothesized to give ESP

learning a boost" (p. 3). In other words, ESP courses are required to educate and train learners to use technical vocabulary or terminology matched to their discipline or profession.

Anthony (2018) defined register as a group of language elements among which are grammatical forms and vocabulary items having a link with a specific situation, purpose, or social context. Nation (2001) views it as a firm basis to teach and design an ESP course focusing on grammar such as the linguistic elements of formal academic writing style in EAP. He also gives an example of the role of register analysis in EOP. It can indicate the *grammar forms* which are likely to be used in one target setting than another such as teaching *directions* to flight controllers and *requests* to hotel service are just instances. It can also categorize *vocabulary* into *technical* or *semi-technical* according to its occurrence in different types of texts.

Register Analysis and Technological Tools

Register analysis has greatly developed with the inclusion of corpus analysis techniques. A corpus is a set of electronic authentic spoken or written texts which are classified according to specific fields. As put forth by Bhatia et al. (2008), computers and computer software facilitate the task of analysis. These may include concordancing software that can be employed to access to those texts and identify their specific linguistic features. For example, the corpus analyst can look for the way and the place the noun phrases are employed in academic written or spoken texts.

Criticism

Dudley-Evans et al. (1998) think that register analysis has failed to provide an "explanation of why certain grammatical patterns are favoured by the English of Science and Technology, nor of how sentences are combined to form paragraphs and whole texts or 'discourse' " (p. 22). Dou et al. (2023) claim that "register analysis was criticized as giving excessive focus on language form, and had failed to explain why and how sentences were

created and integrated for use in specific disciplinary situations" (p. 3)

2.3.2.4. Genre Analysis

Genre analysis is another approach to investigating specialist discourse. Per Basturkmen's (2010) perspective, "genres are types of texts, such as academic lectures or conference abstracts, nursing care plans, sales' letters or news reports" (p. 45).According to Hyland (2006), "Genre is a term for grouping texts together, representing how writers typically use language to respond to recurring situations" (p. 46).Swales (1990) considers genre as referring to spoken and written language products such as "a research presentation, business letter, or prescription" on one hand, and the ways of detecting the analytical procedures, specialists, and academic disciplines ruling the ways of genres creation, decoding and practice (as cited in Anthony, 2018). Charles and Pecorari (2016) supply the instance of law essays that "can be considered a genre because they communicate information from the student to the lecturer and seek to achieve the purpose of demonstrating that the student has understood the legal point" (p. 50). Genres, then, can simply be put as the types of texts including news reports, nursing care plans, article abstracts and many others.

Role of Genre Analysis

A genre analyst gathers just one sort of these texts then works on the identification of the common functions there, their conventional organization and their specific linguistic features. St John (1996) states, "genre research has attempted to define certain professions through the range of written genre that they regularly use" (p. 6). He believes that understanding such trends and techniques in the texts is of great significance for the pedagogical practices.

Hyland (2006) asserts that "learning about genres does not preclude critical analysis. In fact, it provides a necessary basis for critical engagement with cultural and textual practices" (p. 35). That is, genre analysis unveils the social and ideological structure of texts.

Further, it explains why they tackle some interests and perspectives and ignore others. And, it simplifies written communication through understanding how language operates according to its context. Thus, genres supplies the learners with tools to produce valuable written or oral texts and to analyse them critically. By this process, the skills of communication, creativity and critical thinking have effectively developed.

Discourse Communities

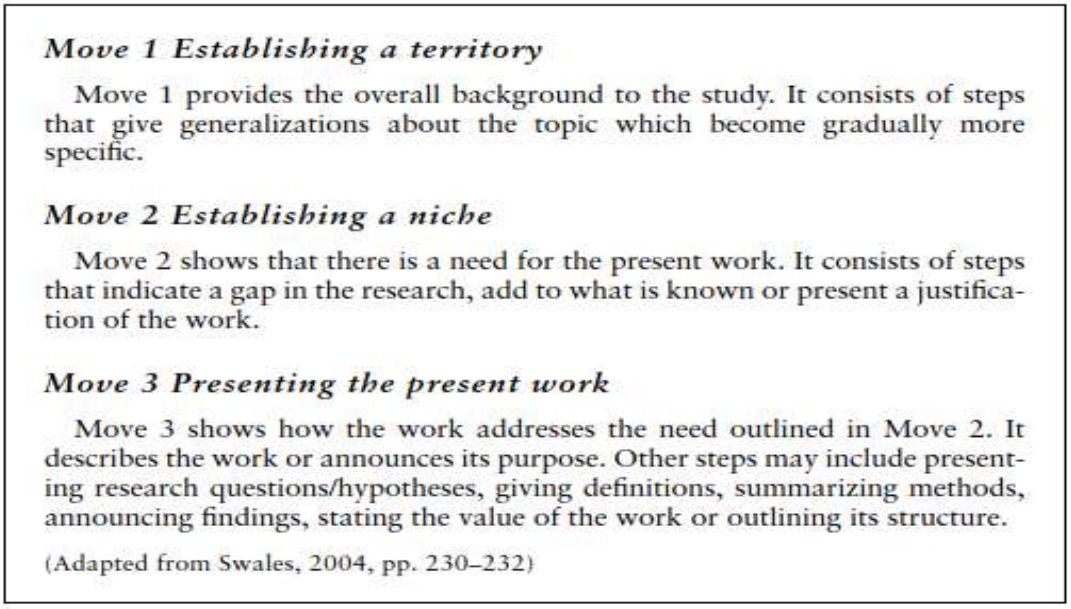
These genres possess a community-specific discourse received or produced by its members who understand how these genres operate. The genre analyst finds the shared features among the investigated samples and explores their usage in a context to identify the underlying drivers behind the genre's characteristics. Charles and Pecorari (2016) explain Swales' *discourse communities* who define them as "groups of people who have common goals and practices which are carried out through the use of language. Discourse communities may own multiple genres, which may be related to each other in sets or networks" (p. 50). According to them, discourse communities can be formed within academic disciplines and result in *disciplinary communities*. In the field of education, for example, disciplinary community encompasses researchers, students, and subject lecturers who share objectives in researching, teaching, and learning about education. Consequently, this fosters the emergence of different genres, such as research articles, conference presentations, lectures, assignments, handouts, and examination questions.Each genre has unique purposes that shape their content, structure, and language. "Thus, an examination question does not include the same content as a lecture, and the language and structure of a research article differ from those of a handout" (p. 50).

On another side, Charles and Pecorari (2016) consider working with genre as gaining extensive popularity and significance in researching and teaching EAP. It has led to the emergence of three distinct approaches: Move analysis, the systemic functional linguistics

approach, and rhetorical approaches to genre. At the outset, *Move analysis* entails examining a collection of texts belonging to a particular genre within a discourse community, identifying any regular structural and linguistic patterns that typify those texts. Each text is analyzed in terms of its functional stages, referred to as moves. Swales' (1990) *Create a Research Space (CARS) model* is a well-known given case in point move analysis that initially centers on the structure of research article introductions, then, it highlights the distinctive attributes of introductions across various disciplines and languages. *CARS model* has served as a

Figure 8

The Create a Research Space (CARS) Model



Move 1 Establishing a territory

Move 1 provides the overall background to the study. It consists of steps that give generalizations about the topic which become gradually more specific.

Move 2 Establishing a niche

Move 2 shows that there is a need for the present work. It consists of steps that indicate a gap in the research, add to what is known or present a justification of the work.

Move 3 Presenting the present work

Move 3 shows how the work addresses the need outlined in Move 2. It describes the work or announces its purpose. Other steps may include presenting research questions/hypotheses, giving definitions, summarizing methods, announcing findings, stating the value of the work or outlining its structure.

(Adapted from Swales, 2004, pp. 230–232)

(*Note.* Adapted from Charles & Pecorari, 2016, p. 50)

framework for many EAP studies such as "results sections, syllabuses, funding proposals, lectures and seminars" (Charles & Pecorari, 2016, p. 51). It enables instructors to effectively teach the organization and language use of diverse genres on one hand, and develops learners' skills to construct well-structured and effective texts through following the established move structures and incorporating appropriate linguistic features on the other hand.

Another key aspect of Charles and Pecorari's (2016) presentation to genre is *systemic functional linguistics approach*. Rooting their approach in Halliday's theory of systemic functional linguistics (SFL), they believe that"genres are used by the members of a society to achieve specific goals, which are reached by means of a series of stages (moves)" (p. 52). The genres proposed by this type encompass general rhetorical functions representing communicative goals texts aim to accomplish, such as narrative, description, and explanation on one hand and also classified into a particular genre according to the linguistic features they employ.

According to Charles and Pecorari (2016), SFL approach to genre aims to not only make students master the genre structure, but also cultivate a critical perspective towards it through the instructional process known as *teaching learning cycle*. These authors also believe that it expands learners' understanding of the genre's content and context.

Table 5

Genre Families and Their Social Function

Genre family	*Social function*
explanation, exercise	demonstrate knowledge and understanding
critique, essay	develop powers of informed and independent reasoning
research report, literature survey, methodology recount	develop research skills
problem question, proposal, design specification, case study	prepare for professional practice
narrative recount, empathy writing	write for oneself and others

(*Note.* Adapted from Nesi1& Gardner, 2012, p. 34 as cited in Charles & Pecorari, 2016, p. 52)

'*Rhetorical approaches to genre'* is the third orientation towards genre explained by Charles and Pecorari (2016). "In contrast to the prominence given to texts, which is apparent in both move analysis and SFL, rhetorical approaches focus on genres as forms of social action and place less emphasis on their content and form" (p. 53). Putting it differently, these

approaches emphasize understanding the ways genres function within specific social contexts and how they are used to achieve communicative purposes, rather than solely examining their textual characteristics or subject matter. This type of genre is considered as temporary and reflective of specific circumstances of specific period of time.

Procedures of Genre Analysis

Charles and Pecorari (2016) present Bawarshi and Reiff's (2010) guidelines for analyzing genre in a context , and hence, understanding the reciprocal relationship between them: First, collecting exemplars of the genre; second, determining the scene and depicting the situation where the genre is employed, obtaining details about its setting, subject, participants, and purposes; third, recognizing and outlining the frequent patterns observed in the genre's characteristics with respect to content, structure, and language.; and finally, exploring the information conveyed by these patterns in relation to the situation and scene such as values, suppositions, objectives, inclusiveness, reader and writer's roles, and the possibilities and limitations imposed by the genre.

2.3.2.5. Corpus Analysis

Dou et al. (2023) claim that "the modern period of ESP development was characterized by another research innovation that uses corpus research, notably in studies of written academic genres" (p. 5). Put it differently, there has been a revival in register analysis with the appearance of corpus analysis. The latter examines texts using analysis programmes.

Basturkmen (2010) mentions corpus analysis as one of the techniques for teachers and course developers to start from while collecting data about specialist discourse. She defines a corpus as "a collection of authentic written or spoken texts available electronically and which can therefore be accessed with computer software" (p. 47). Those texts can represent a language variety or a particular field. Charles and Pecorari (2016) contend that"a corpus is a collection of texts, usually in electronic form, which has been built with a specific purpose in

mind and designed according to specific criteria" (pp. 45-46).

Role of Corpus Analysis

Bhatia et al. (2008) claim that corpus-based analysis was first employed in lexicography and grammar. Hyland (2006) states that a corpus as "a collection of naturally occurring texts used for linguistic study" (p. 58). In the same vein, Basturkmen (2010) contends that "corpus analysis techniques allow investigators to identify patterns in a body of data of language use" (p. 46). Corpus analysis identifies specific linguistic features like noun phrases in academic written or spoken texts or makes lists of the frequently occurring words in the corpus.

Similarly, Charles and Pecorari (2016) shed the light on some areas where corpora have been instrumental. Corpora can be utilized to examine language usage patterns, enabling EAP teachers to gain insights into academic English within their students' respective fields and disciplines. Additionally, they serve both a direct and indirect role in language learning. In the direct role, students engage with corpus data to study language aspects predominantly employed within the scope of academic writing. These authors also cite Johns' (1991) *'data driven learning (DDL)'*. DDL is an approach viewing the learner as a researcher whose task is to engage in direct and deep processing of the language within authentic corpus, then inductively deriving linguistic descriptions and validating generalizations about language by themselves. This stands in opposition to conventional approaches where learners are provided with linguistic rules and tasked with their application.

Conversely, the indirect role involves corpora providing the foundation for pedagogical resources like dictionaries and reference grammars (such as the *Cambridge Grammar of English).* Corpora enable the observation of repeated language patterns in vast amounts of real-world text, enhancing our comprehension of EAP and providing solid basis for fostering teaching materials and references. The authors support their evidence with the

example of Biber (2006). The latter demonstrates substantial distinctions between spoken and written university discourse; for instance, class interaction emphasizes the frequent use of first and second person pronouns (we and you) whereas attributive adjectives prevail in textbooks. Another application of corpus analysis is in characterizing and distinguishing the discourse of specific disciplines and genres. A given case in point is Hyland's (2005) comparison of social sciences and humanities with natural sciences where he shows that the former exhibited higher frequencies of the writer's position markers such as 'I agree' and 'clearly'.

An additional realm of corpora application Charles and Pecorari (2016) pointed out is the analysis of language learners' production which demonstrates the differences in writing between L1 and L2 (e.g. L2 frequent use of spoken language features) and serves as a valuable tool in identifying significant challenges encountered by learners while writing in English. Thus, examination of learner corpora is vital for creating EAP teaching materials, making a substantial impact on the design process.

Corpus Analysis Techniques and Concordancing

The detailed studies of corpora have been facilitated by the availability of software tools. Woodrow (2018) affirms that "with computer technology, corpus-analysis techniques are now accessible without the need for sophisticated analytical skills" (Sources of ESP vocabulary, para. 2). Those tools depict the grammar and vocabulary of the intended texts instantaneously. Over and above that, they present new perceptions of features of language use which are already there and frequent but taken for granted. They allow teachers to explain the reasons behind preferring an expression or phrase over another in a particular setting. Words as well as grammatical features can be counted using the system of 'tagging'. Codes depicting the part of speech of the target word, say verb or noun whenever it occurs. Thus, advanced data can be gathered a given genre. However, corpus analysis is considered as a reliable guide to the nature of language rather than being based on human intuition and mere observation.

Thus, it is an approach to language teaching that is founded on scientific evidence.

Table 6

Most Frequent Nouns in Introductory Textbooks in Two Disciplines

Applied linguistics			*Biology*		
No.	*% of total*	*Word*	*No.*	*% of total*	*Word*
423	0.8663	language	166	0.4304	species
149	0.3052	speech	150	0.3889	DNA
128	0.2622	example	143	0.3708	spores
127	0.2601	interaction	135	0.3500	organisms
106	0.2171	act	117	0.3033	bacteria
101	0.2069	communication	116	0.3008	fungi
97	0.1987	students	95	0.2463	figure
93	0.1905	text	89	0.2307	organism
93	0.1905	acquisition	75	0.1945	RNA
91	0.1864	acts	68	0.1763	spore
90	0.1843	face	62	0.1607	cells
89	0.1823	input	59	0.1530	section
86	0.1761	rules	58	0.1504	genus
85	0.1741	communicative	55	0.1426	cell
79	0.1618	knowledge	49	0.1270	disease

(*Note.* Adapted from Hyland, 2006, p. 59)

“Corpus software provides several tools which present language data in different ways, but the most frequently used for pedagogical purposes is the concordancer”(Charles & Pecorari, 2016, p. 48). The concordancer tool searches corpus for word or phrase instances, presents those instances on the screen on a line along with its surrounding context, and positions the search term in the center with a few words on either side. Charles and Pecorari (2016) introduce a concordance of the word "variety" from a corpus of theses, showcasing its collocations and the collocation "wide variety" is more common than "broad variety". They also demonstrate that the lexical components ‘wide’ and ‘variety’ frequently occur with the grammatical items ‘a’ and ‘of’ to create the expression ‘ a wide variety’ of.

Concordancing exposes frequencies and meanings of key phrases as well as word-combinations in examples of a search word or phrase. For Davies (2002), the utilization of a concordancer is advantageous for both teachers and learners. It enables educators to efficiently develop educational activities and handouts depending on real-world materials. It also engages students in exploring language patterns and better understanding of grammar

through autonomous and individual research.

Figure 9

Concordance on the Word 'Variety'

1.	imposed by Vico on the **huge**	**variety**	of human history - then we ar
2.	celebration of the "**infinite**	**variety**"	of subject-positions and an
3.	all contributing to the **rich**	**variety**	that makes up Humanity. Mazz
4.	ities of material, the **wide**	**variety**	of conditions within the conf
5.	lack in one batch of a **given**	**variety**	(e.g. Raven 430) has a large
6.	these qualifications a **large**	**variety**	of samples have been measured
7.	dies of treatments on a **wide**	**variety**	of materials. <p>The details
8.	that it depends upon a **wide**	**variety**	of factors. This has enabled
9.	experiments, we chose a **wide**	**variety**	of benchmarks, totalling ove
10.	ering diets. Yet with a **wide**	**variety**	of foods available to north-w
11.	mino acids occurs via a **wide**	**variety**	of metabolic routes, the car
12.	bbey, and it contains a **wide**	**variety**	of types of material and writ

(*Note*.Adapted fromCharles & Pecorari, 2016, p. 48)

It seems concluding that specialist discourse analysis can be made in several ways and it stands as a significant stage in course design. Its approaches study examples of authentic language use within specific academic and professional contexts. ESP course designers or educators can depend on the findings of these analyses to select the relevant materials to meet their learners' needs. In addition, specialist discourse analysis contextualizes language so that learners can communicate effectively within their respective disciplines.

2.3.3. Learning Objectives of an ESP Course

Woodrow (2018) claims that "needs-analysis data is translated into course objectives and teaching aims" (2018, Moving from needs analysis to course design) though the students' needs are prone to change throughout the ESP course timeframe. Charles and Pecorari (2016) affirm that "the learning objectives for a course drive the nature of the content which will be taught, but decisions need to be made about how to deliver the content" (p. 68). In their perspective, learning activities variation is beneficial for learning efficiency.

2.3.3.1. Definition

Based on the works of Johns and Dudley-Evans (1991) and Robinson (1991),

Hyland (2006) affirms that needs analysis determines the content to be incorporated in ESP/EAP curricula through a depiction of the academic skills and genres non-native language learners may deal with in their current courses or future communicative contexts. Academic disciplines necessitate a variety of communicative forms for the learners to master successfully while studying at university or and employ relevantly after their graduation in the workplace. Thus, the learning objectives have to be identified at the initial stages of the course design process.

Charles and Pecorari (2016) contend that "learning objectives should be expressed as clear statements about specific things which the student will be able to *do* (as opposed to what the student will *know*) at the end of the course" (pp. 65, 66). They also state that setting one or more specific learning objectives aims to "close the gap between where learners are and where they need to be" (p. 65). Accordingly, learning objectives should be formulated as precise statements that clearly articulate specific outcomes or accomplishments.

Ulum (2022) believes that "having and classifying objectives support teachers in planning and supplying quality education, forming proper assessment tasks, and ensuring teaching to go parallel with the objectives" (p. 170). Anthony (2018) argues that a learning strategy is also important along with language, genres, and skills. He adds that the sequencing learning objectives covers clarity, logic, fun, interest, flexibility, reinforcement, and practice-opportunities generator.

Unlike GE where the learning objectives match to grammar items and rules and vocabulary lists, ESP courses objectives essentially depend on NA results. In addition, Swanson and Case (1997) state that "from a student's perspective, tests are viewed as a way not only to earn grades, but also to determine the course goals and the relative importance of course material" (as cited in Newton & Martin, 2013, p. 78).

Drawing on the insights of Dudley-Evans and Saint John (1998) and Hyland (2006),

Dou et al. (2023) claim that ESP aims at increasing the outcomes of the foreign language classes through setting well-designed short-term or long-term courses and programs with specific learning objectives to meet: learners' needs, broad targets of a course or program, learners' aspirations upon completion of a program.

Chan et al. (2002)conduct a research to investigate the practical use of various educational taxonomies in assessing the cognitive learning outcomes of students particularly the Structure of the Observed Learning Outcomes (SOLO) taxonomy, Bloom's taxonomy and reflective thinking measurement model.

2.3.3.2. The SOLO Taxonomy

Definition and levels of knowledge hierarchy

As an acronym for 'Structure of the Observed Learning Outcome, "The SOLO taxonomy is essentially a language for describing the level and quality of learning both within and across the curriculum" (Biggs & Collis, 1989, p. 151). Based on the insights of other scholars, Newton and Martin (2013) affirm that the "SOLO taxonomy was developed by Australian academics Biggs and Collis (1982) and is a method of describing the level of increasing complexity in a student's understanding of a subject through five stages" (p. 81). They add that it can be effectively utilized in teaching by employing its progressive levels to create test questions and learning objectives for skill development. Chan et al. (2002) claim that this taxonomy "was designed in accordance with Piaget's different cognitive stages of development by John Biggs in 1982 for the purpose of classifying students' responses" (p. 513).

Boulton and Lewis (1995) discuss the efficacy of the application of the SOLO taxonomy for fostering and evaluating higher-order thinking skills in higher education. They define it as "taxonomy of the structure of learning outcomes" (p. 145). Boulton and Lewis (1995, p. 145) along with Lucas and Mladenovic (2009, p. 260) emphasize the belief of

Biggs and Collis (1982; 1989) that this taxonomy is concerned with content as well as knowledge structure in a hierarchical manner ranging from incompetence to expertise in the following levels:

1. The pre-structural level is marked by incompetence, where the student has no knowledge or understanding of the point in the subject matter. The task is inadequately done, and the learner has not grasped the target concept or objective.

2. The uni-structural level relies on the principle of the learner possessing knowledge of a single specific aspect of the subject matter. This principle can be applicable for the performance of a task though the level of understanding remains limited.

3. The multi-structural level emphasizes the learner's surface knowledge acquisition about each isolated aspect of a task without setting any integration or connection between its several aspects. The presentation of information can take the format of a straightforward simple list having no connection among its components.

4. The relational level entails empowering the learner to form a bigger picture about knowledge rather than dealing with it as isolated elements. The learner is able to establish relationships between knowledge components and employ them for a deep comprehension or effective problem solving. Thus, this level combines the aspects of knowledge into a unified and meaningful whole.

5. The Extended Abstract involves approaching the *Relational Level* from a broader view and higher degree of abstraction (conceptualization) which permits a deeper comprehension of a new topic or area. In other words, this level allows the generalizability of the already acquired knowledge to be applied to novel contexts.

Usefulness of the SOLO Taxonomy

Boulton and Lewis (1995) acknowledge that the SOLO taxonomy can be useful in many ways. It can be employed to score students' knowledge of subject matter within a

specific discipline and their understanding of its organizational structure. Further, they believe that it can serve as a framework for motivating students to actively participate in deep learning experiences along with structuring and communicating their understood knowledge in their own way. On their part, teachers can also get advantage from this simple and straightforward taxonomy as it offers suggested grading models and does not require excessive time or effort. Newton and Martin (2013) agree with Hodges and Harvey's (2003) description of the five levels of the SOLO Taxonomy as reflecting a student's capacity to establish meaningful connections between concepts and apply them to novel ideas.

Matched to the learning objectives in the context of ESP, the SOLO Taxonomy can be employed to structure and guide the development of learning objectives according to its framework of five progressive or increasing levels of complexity and depth of understanding. When designing learning objectives using this taxonomy in ESP, teachers can ensure that learning objectives are closely connected to the specific language and communication skills relevant to the field or context. They can start by developing simpler objectives at the lower levels (prestructural and unistructural) that emphasize fundamental understanding and knowledge acquisition. As students make progress, the objectives can be tailored to foster more advanced skills such as analysis, synthesis, and evaluation (relational and extended abstract levels). By integrating the SOLO Taxonomy into the design of learning objectives in ESP, practitioners can ensure that these objectives are compatible with the targeted goals and provide a well-defined evolution of skills and understanding for students in their specific domain of study.

2.3.3.3. Bloom's Taxonomy

Definition

Based on Newton and Martin's (2013) viewpoint, Bloom's taxonomy was initially introduced in 1956. They confirm that "Bloom's taxonomy is primarily a system for

classifying learning objective" (p. 82) while Gershon (2013) believes that "it guides teachers towards creating lessons more easily and with clear objectives" (as cited in (Horváthová & Naďová, 2021, p. 4). As for Motlhabane (2017), Bloom's taxonomy "hierarchy has been a major aid to educators planning for and considering all levels of thinking and focusing on the inclusion of higher order thinking in lessons, units of instruction and national curricula" (p. 920).

In Scully's perspective, Bloom's original taxonomy did not set a clear distinction between lower-order and higher-order thinking. So, it was revised by Anderson and Krathwohl in 2001. Establishing a solid foundation at the former paves the way for the development of the latter (Horváthová & Naďová, 2021).

As per Aviles (2000), Bloom's Taxonomy of Educational Objectives serves as a valuable tool in the field of education, assisting both novice and experienced teachers in developing a clearer understanding of teaching and assessing critical thinking skills (as cited in Riazi & Mosalanejad, 2010). As put forth by Krathwohl (2002), "it provides an organizational structure that gives a commonly understood meaning to objectives classified in one of its categories, thereby enhancing communication" (p. 218). Shabatura (2018) affirms that fact before becoming able to understand a concept, "you must remember it. To apply a concept, you must first understand it. In order to evaluate a concept, you must have analysed it. To create an accurate conclusion, you must have completed a thorough evaluation" (as cited in Horváthová & Naďová, 2021, p. 4).

The differences between the original and the revised Bloom's Taxonomy

In Bloom's Taxonomy, the cognitive dimension comprises six hierarchical categories: knowledge, comprehension, application, analysis, synthesis and evaluation (Chan et al., 2002). Hosseini (1993) defines each of these categories as follows:

> "Knowledge" is recollection or remembrance of previously learned materials. "Comprehension" is the ability to understand and interpret facts and principles. "Application" refers to the ability to apply learned materials in new and concrete situations. "Analysis" is the ability to break down materials into its component parts so that the relationship between parts can be understood. "Synthesis" brings together parts or elements to form a whole. "Evaluation" concerns the ability to judge the value of materials learned, including the ability to indicate logical fallacies in arguments. (Chan et al., 2002, p. 513)

In his paper 'A Revision of Bloom's Taxonomy: An Overview', Krathwohl considers some differences between the original taxonomy and the revised version. In the first place, Bloom's taxonomy was considered as a cumulative hierarchy which constructs '*knowledge'* progressively starting from the mastery of simpler categories as prerequisites for more complex ones. In contrast, the revised taxonomy is a two-dimensional model: Firstly, '*Knowledge'* being similar to the original 'Knowledge'; and secondly, '*Cognitive Processes'* bearing a resemblance with the foundational six categories with the modifications to be mentioned below.

Next, its Knowledge category encompassed both a noun aspect standing for the subject matter, and a verb component emphasizing the capacity to recall or recognize knowledge. However, the revised taxonomy separates the noun and verb aspects into distinct dimensions; the noun element depicts the Knowledge dimension, while the verb item represents the Cognitive Process dimension, bringing consistency to the framework.

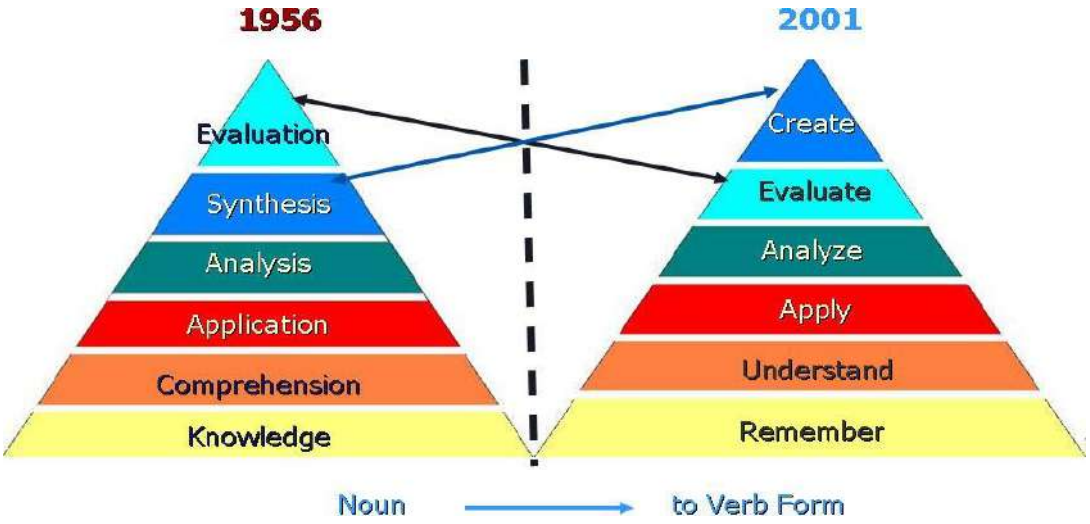
Another point Krathwohl reflects on is related to the knowledge dimension. Compared to the original three, the new Knowledge expands to the fourth category: Metacognitive Knowledge. While three of these categories keep the substance of the subcategories from the original framework, they were reorganized and updated to conform to the terminology and

progress in cognitive psychology. Metacognitive Knowledge entails knowledge about cognition in a broader context and self-awareness of one's own cognitive functioning. This awareness of metacognitive processes helps learners in effectively applying this knowledge to adapt their thinking and actions.

Equally important, Krathwohl states that despite maintaining the numbers of six categories, category names were replaced by verb forms, three of them were given new names, the positions of two were switched (*Synthesis* placed in the top and transformed into the verb *Create*), and the two pyramid bottom categories were renamed to align with their frequent use in objectives (*Knowledge* and *Comprehension* become *Remember* and *Understand* consecutively).

Figure 10

Bloom's Taxonomy Revised



(*Note.* Adapted from Wilson & Leslie, 2016)

However, the most noteworthy divergence Krathwohl mentions and that sets therevised taxonomy apart is the shift of emphasis from the six major categories to the specific cognitive processes within those categories.

Last but not the least, Krathwohl believes that the revision of taxonomy intends to simplify the teachers' mission in using the framework. Consequently, its categories are made

more flexible and can overlap in their scope. Vavilina (2020) claims that expressing educational and instructional objectives becomes a commonly accepted formula consisting of a verb and a noun: "a verb stands for the cognitive process (Remember, Understand, Apply, Analyze, Evaluate, Create) and a noun indicates the type of knowledge (Factual, Conceptual, Procedural, Metacognitive)" (Anderson et al, 2001, p. 27).

Riazi and Mosalanejad (2010) conduct a study to examine the categories of learning objectives presented in the Iranian senior high schools and pre-university English textbooks. They develop a coding scheme based on Bloom's taxonomy and the learning objectives are codified in coding scheme table. The latter includes definitions of the six levels of the cognitive dimension, keywords examples indicating each level and present samples of task rubrics.

Table 7

Coding scheme based on Bloom's Taxonomy of cognitive domain

Level	**Definition**	**Key Words andExamples**	**Sample TaskRubrics**
Knowledge	Recalling data orinformation	**Key Words**: define, describe, identify, label, list, match, name, outline, reproduce, select, state. **Examples**: The student recalls and/or quotes information from memory to the teacher.	Fill in the blanks with appropriate words
Comprehension	Understanding the meaning, translation,and interpretation of instructions and problems; Stating aproblem in one's ownwords	**Key Words**: describe, estimate, explain, extend, generalize, infer, interpret, paraphrase, predict, rewrite, summarize, and translate. **Examples**: The student translates, comprehends, or interprets informations/ he has received.	Answer the questions according to the reading
Application	Using a concept in anew situation orunprompted use of anabstraction; Applyingwhat was learned in theclassroom into novelsituations.	**Key Words**: apply, change, compute, demonstrate, discover, manipulate, modify, predict, prepare, produce, relate, show, solve, use. **Examples**: The student applies the new information in his/her future assignments or classroom activities.	Make sentences using the given pattern and words.

Analysis	Separating material orconcepts intocomponent parts so thatits organizationalstructure may beunderstood	**Key Words**: analyze, breaks down, compare, contrast, discriminate, distinguish, identify, illustrate, infer, outline, relate, select, separate. **Examples**: The studentcompares and contrasts anewstructuretotheones previously learned.	Compare the following words to see how they sound differently.
Synthesis	Putting parts togetherto form a whole, with emphasis on creating anew meaning or structure	**KeyWords**: categorize, create, devise, design, explain, organize, plan, arrange, reconstruct, relate, revise, rewrite, summarize, tell, write. **Examples**: The student integrates information from several sources to solve a specific problem or to answer a question.	Make sentences using the scrambledwords.
Evaluation	Making judgments about the value of ideas or materials	**Key Words**: appraise, conclude, critiques, evaluate, judge, justifies, relate, support. **Examples**: The student selects the most effective solution to a problem andis able to justify it.	On the scale, show how you evaluate the words. Which of the followings is the best answer to the question? Why?

(*Note.* Adapted from Riazi & Mosalanejad, 2010, p. 15-16)

The original Bloom's taxonomy has been renewed to keep up with today's information age (Ulum, 2022, p. 171). In the study of Ulum (2022), he affirms that the revised Bloom's taxonomy (also known as Anderson and Krathwohl's Taxonomy) shifts the focus from "the partially passive image of educational objectives and hints on a more active conception of categorization. The revised taxonomy employs verbs and gerunds to refer to cognitive levels unlike the nouns employed in the original taxonomy" (p. 170). He adds, Anderson and Krathwohl assembled a team of educational psychologists and educators to collaborate on the revisions and modernization of Bloom's taxonomy, then, published their work in 2001.

As part of revising Bloom's taxonomy, Krathwohl (2002) summarizes that this table can be used "to classify objectives, activities, and assessments provides a clear, concise, visual representation of a particular course or unit" (p. 218). He explains the technique of using the taxonomy table as follows. After filling it out, instructors become capable to analyze and evaluate the emphasis degree placed on several components, determine the conformity

with the curriculum of the curriculum with the taxonomy, and detect any overlooked or skipped any educational opportunities. This examination enables teachers to make decisions about their curriculum planning and tailor their instructional strategies to better enhance their teaching effectiveness and meet the needs of their students.

2.3.3.4. Taxonomy of Reflection (Reflective Thinking Model)

Chan et al. (2002) maintain that the Taxonomy of Reflection "divides students' written work into two categories: non-reflective and reflective" (p. 514). They add that it was first introduced by Kember (1990) to be used for measuring the extent of reflection and critical thinking demonstrated in learners' written assignments.

Chan et al. (2002) describe its two categories: first, reflective involving reflection and critical reflection, is made up of two classes itself: '*Content reflection'* focusing on our perception and understanding on one hand and *'process reflection'* related to perception methods; second, the non-reflective category is divided into two sub-levels: habitual action (the lowest level) which entails performing tasks instinctively, with little conscious deliberation. Meanwhile, thoughtful action involves employing prior knowledge, akin to the "application" category found in Bloom's taxonomy.

2.3.3.5. Constructive Alignment

Biggs (2014) defines constructive alignment (CA) as "an outcomes-based approach to teaching in which the learning outcomes that students are intended to achieve are defined before teaching takes place" (p. 5), and hence, teaching and assessment approaches are purposefully planned to ensure the maximum achievement of the desired outcomes.

Charles and Pecorari (2016) affirm that constructive alignment has a significant role in matching learning objectives to the components of course design and make them conform to the course content and assessment. Aiming to elevate the level of teaching and learning, Wang et al. (2013) define it as "a pedagogical approach that is embedded in the constructivist

theory of learning, emphasising the alignment between the intended learning outcomes (ILOs), TLAs [Teaching and Learning Activities] and assessment tasks (ATs)" (p. 477). Accordingly, the criteria for assessing students' learning outcomes cover their academic average and grades, knowledge and skills in the subject matter, behavioural changes, degree completion, and degree of satisfaction with a course, etc.

Constructive Alignment Techniques

Biggs (2014) depicts the techniques of CA operation; teaching based on CA operates through involving students in learning activities to best attain the target outcomes on one hand, and design assessment activities resulting in accurate and reliable evaluation about the extent of that attainment on the other.

Wang et al. (2013) present the main four phases of Constructive Alignment curriculum design stated by Biggs and Tang (2007) in order to measure the degree of interconnectedness of its components ILOs, TLAs and ATs:

> •Defining the ILOs specifying activities needs to be activated in teaching by using action verbs appropriate to the context and content of the course.
>
> • Creating a learning environment facilitating students' performances in desired activities specified by the ILOs.
>
> • Using ATs eliciting the target action verbs.
>
> • Judging students' performances using clearly stated grading criteria. (p. 480-481)

Wang et al. (2013) also cite the belief of Tran, Nguyen, and Nguyen (2010), indicating that constructive alignment as a learner-centered paradigm which empowers them to actively construct their own knowledge during and after class without dependence on the teacher. In the same vein, Biggs (2014) explains that the reasons behind this assertion are due to CA's focus on learners' accomplishments and the best ways of engaging learners to attain the intended goals.

Characteristics of Constructive Alignment

Biggs (2014) presents the features CA being criticized for. He makes a reference to Jervis and Jervis (2005) who object its behaviourist nature of predetermined objectives. He also mentions that Hill (2012) criticizes teaching based on predetermined learning outcomes as being a form of imposing inflexibility and constraints on the teaching process.

However, Biggs (2014) defends the principles of CA through the coming arguments: First, CA supports instructors' autonomy in indentifying learning outcome statements and adaptability in employing open-ended verbs related to learning outcomes and assessment tasks; second, CA engages learners in learning experiences to freely showcase unique and individual tasks solutions without any constrained or predetermined responses by means of open-ended assessment methods such as portfolios.

On another side, Biggs (2014) lists the advantages of constructive aligned courses from the perspectives of researchers implementing it in a variety of disciplines classes. Here are some examples where he reports their findings and empirical evidence:

- Hodinott (2000) finds that CA resulted in enhancing biology learners' outcomes level despite the increased workload on staff and learners.
- Boyle (2007) identifies a great improvement in learner's outcomes through reviewing and assessing a yearly record of earth sciences classes' performance.
- Morris (2008) concludes that CA impacts positively statistics learners' completion of summative assessment, entailing a shift towards higher-order cognitive skills as well as enhancing their understanding and achievement in exams.
- Raeburn et al. (2009) argues that CA maximized health sciences learners' engagement and academic improvement.

Biggs (2014) abridges "constructively aligned teaching seems to produce high quality learning outcomes and student satisfaction" (p. 14).

In a nutshell, ESP course design goes through several stages. It starts by determining learners' needs via questionnaires, interviews, etc; next, it moves towards investigating the specialist discourse through ethnographies, register analysis, genre analysis, corpus analysis or discourse analysis. Then, it reaches the step of identifying the learning objectives of the course. After identifying the learning objectives through analyzing learners' needs, the subsequent phase is converting them into a practical course plan (Charles & Pecorari, 2016).

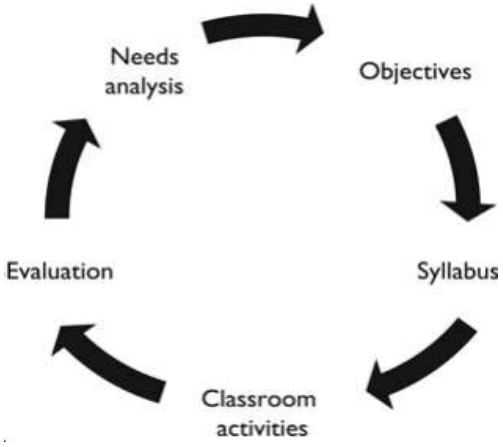
2.3.4. Transferring Needs Analysis Findings into Course Content

2.3.4.1. Syllabus Design for ESP Courses

In search for most effective approaches to design, plan and implement courses, a number of syllabuses have appeared. Designing a syllabus needs an overview about the background, difficulties, and needs of students. In the view of Long and Crookes (1992), "choice of the unit of analysis in syllabus design is crucial for all aspects of a language teaching program" (p. 1). They cite that different types of syllabus base their analysis of 'the target language and its use' on various units being them word, structure, notion, topic or situation.

Figure 11

ESP Course-Design Cycle



(*Note.* Adapted from Woodrow, 2018)

Jordan (1997) briefly explains *'a syllabus'* as "a specification of what to be included in a language course" (p. 56). It is also described as an outline document covering the basic elements of a language course. Its design starts from deciding the language learners' needs and objectives through a needs analysis, and then moves to list the selected language forms, subject content and required skills. Another further step entails organizing and sequencing that content and setting it into controllable units. Decisions are made about the types of class activities and tasks, the materials to be used, the teaching method(s) as well as an assessment of the teaching-learning process. It is at this stage that the course can be designed, taught within an already-set timetable and provided with feedback.

Characteristics of Modern Effective Syllabi

For Yassi and Kaharuddin (2018), an effective course relies on the proper planning that precedes it to attain the desired instructional objectives. Accordingly, a syllabus is needed. They defined the term syllabus as "the content or subject matter of an individual subject" (p. 16). They cite White's (1988) perception of the concept of syllabus design as encompassing the definition and organization of the linguistic content along with the identifying the roles of teachers and educational materials. Jordan (1997) points out to some features of an effective syllabus in the coming points:

- **Situational-language:** it puts the learners in real-like or real contexts of their discipline where they use the appropriate language such as at the dentist', at the doctor's, complaining to a company, meeting a new director, etc.
- **Topic-based syllabus:** Selected topics are related to the learners' field of study and its language; therefore, it allows practicing the appropriate syntax and lexis.
- **Content-Based language teaching:** it reflects the specific components of an academic field of study which are its language, skills, academic conventions, and subject matter. For Woodrow (2018)**, "t**his approach sees language as holistic, dynamic, interactive and

situated, with an emphasis on both context and the interactions that create that context" (Using a content-based approach in a EGAP course). Based on the notion that the different types of syllabi indicate the distinct needs of the target audience, Cowling (2007) claims that "the content-based syllabus would cover the following modules: (i) describing products and services; (ii) business presentations; (iii) business meetings; (iv) business negotiations" (p. 434). Business learners may have a course about, say, oil companies and would naturally present words such as rig.

Types of Syllabuses

As put forth by Dick (2005), the type of syllabus is selected by the designer depending on the items to be emphasized and the methods of their sequencing while teaching (as cited in Yassi & Kaharuddin, 2018). In other words, multiple types of syllabuses exist with various focal points. In the perspective of Reilly (1988), "choices of syllabi can range from the more or less purely linguistic... to the purely semantic or informational" (p. 2) depending on their focus. Reilly adds that these types of syllabi are often intertwined and overlap in practice rather than being used in isolation.Reilly (1988) lists six of the syllabi types.

-First, the content of the Structural-Formal Syllabus emphasises the language forms and structures such as word types and clauses;

-Second, Notional-Functional Syllabus is concerned with teaching the use of language to perform particular functions (e.g. agreeing, requesting, apologizing) and express some notions (colour, time, size, age, etc). Cowling (2007) argues that the notional–functional syllabus components would precede the content-based syllabus items in the full educational program. He believes that this serves to create "more structured lessons in the first half of the course (an approach which the students are used to) and move onto a more challenging content/task-based lesson format for the final half of the course" (p. 434). Cowling (2007) suggests that this type of syllabus in business would "take into account of

the following modules: (i) business introductions; (ii) hosting business visitors; (iii) business telephoning; (iv) placing business orders; (v) describing business trends" (p. 434);

-Third, a Situational Syllabus relies on the employment of a collection of authentic or real-like situations where the participants communicate using the target language such as "seeing the dentist, complaining to the landlord, buying a book at the book store, meeting a new student" (Reilly, 1988, p. 3);

- Fourth, Skills-Based Syllabus entails teaching specific competences that assist at using language effectively. For Fanning (1988), the term 'skill' traditionally makes reference to one or combination of more than one of the four basic language skills: speaking, listening, reading and writing. He adds that 'skill' expands to include the sub-components or derivations of those four skills known as 'study skills'. For instance, writing and speaking involve sub-skills like paraphrasing, summarizing and interpreting graphical information. Listening can involve taking notes. Reading can be split into skimming, scanning, reading for specific details or concepts, and so on. ESP learners need to further develop their cognitive skills such as critical thinking and problem solving. These skills allow them to remember, reason, argue, etc and, hence, cope with different daily class and life situations;
- Fifth, Task-Based Syllabus is described by Reilly (1988) as being concerned with teaching language through performing a series of tasks. He claims that while situational syllabus intends at teaching language relevant to a particular situation with predetermined outcomes, the task-based one involves the learners in the process of language use as an ultimate goal.

Motteram (2016) describes a task-based learning activity as being "towards the end of the task cycle, the group and the teacher could go back over the language that they have used and consider areas where they have had difficulties and then consider how these can be resolved" (p. 96). The term task has been defined in many ways. Littlewood (2004) collects

some of specialist views towards it. He starts with Williams and Burden (1997) who introduce 'task' as an activity in which the learners are involved to accelerate their language learning process. He moves to Breen (1987) who defines the task as a set of learning activities sequenced according to their length and complexity and gives the examples of group problem-solving and decision-making exercises. He sheds the light on Estaire and Zanon's (1994) distinction between 'communication' tasks and 'enabling' ones or what Willis (2000) specifies as "exercise"; the former prioritizes meaning over form while the latter's fundamental concern is linguistic features including grammar, lexis, functions in addition to discourse. He also attracts the readers' attention to Stern's (1992) description of language tasks as having realistic in their topics, activities and issues they address. Whatever the nature of 'task' is, the advocates of task-based approach believe that students can learn better when they feel free from any task assignments, but rather through being engaged in natural discussions.

Table 8

The Continuum from Focus on Forms to Focus on Meaning

Focus on forms		←	→	**Focus on meaning**
Non-communicative learning	**Pre-communicative language practice**	**Communicative language practice**	**Structured communication**	**Authentic communication**
Focusing on the structures of language, how they are formed and what they mean, e.g. substitution exercises, 'discovery' and awareness-raising activities	Practising language with some attention to meaning but not communicating new messages to others, e.g. 'question-and-answer' practice	Practising pre-taught language in a context where it communicates new information, e.g. information-gap activities or 'personalized' questions	Using language to communicate in situations which elicit pre-learnt language, but with some unpredictability, e.g. structured role-play and simple problem-solving	Using language to communicate in situations where the meanings are unpredictable, e.g. creative role-play, more complex problem-solving and discussion
'Exercises'	←	*(Ellis)*	→	*'Tasks'*
'Enabling tasks'	←	*(Estaire and Zanon)*	→	*'Communicative tasks'*

(*Note.*Adapted from Littlewood, 2004, p. 322)

Task-based syllabus has no preselected content by textbooks or teachers. A fact which frees students from practicing predetermined language resources. The lesson objectives and language depend on the learners' achievement of a task which is defined by Littlewood

(2004) as a unit “around which a course is organized” (p. 324). Drawing on the insights of such view, Littlewood (2004) states that “in current pedagogical discussions, however, it is difficult to avoid the term ‘task’ as it once was to avoid the term ‘communicative’” (p. 319). It goes through several stages in the classroom. It begins with pre-task phase where the teacher explains explicitly the task instruction to the learners along with refreshing their memories with some language and situations as helpful models at performing the task. The task phase is the real performance of the instruction; learners are exposed in groups or pairs to various language forms and patterns meanwhile the teacher provides guidance and encouragement. During the planning and report stages, the learners plan then present a report about what they experience while doing the task. The teacher can analyse the language of their production, decide their needs then introduce more tasks for noticing and practicing the useful language features. This approach aims at motivating students to spend much of their time communicating using the covered language. In similar vein, Evans (2013) asserts “its emphasis on purposeful communication and skill integration” (p. 291). We can take, for instance, the task of oil drilling company job interview. Students are instructed to think about the questions that can be asked by the interviewer and the replies of the interviewee. They can choose from a list of provided questions to write a whole interview.

Contrary to previous syllabuses which are based on the analysis of the target language or language use, the task-based one takes into account the principles of human learning and/ or second language learning (Long & Crookes, 1992);

- Sixth, a Content-Based Syllabus is the last type presented by Reilly (1988). It emphasizes primarily the teaching of the subject matter using language. In other words, the students tackle the content of a particular subject matter and learn the language a t the same time. It differs from the task-based syllabus in that it targets the information while the former focuses on communicative and cognitive processes.

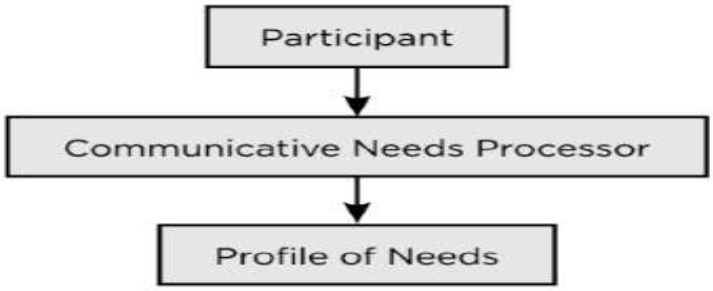
Models of Syllabus Design in ESP

Yassi and Kaharuddin (2018)introduce two models of ESP syllabus design. First, Munby's Syllabus Design Model (1978) which focuses on three elements: "the participant, the communicative needs processor and profile needs" (p. 20). According to this framework, course designer collects information collected about the learner as a participant in the learning process (sex, age, nationality, L1 and L2).

language requirements of the learners and the target objectives of completing a course.

Figure 52

Munby's Syllabus Design Model



(*Note*. Adapted from Yassi & Kaharuddin, 2018, p. 20)

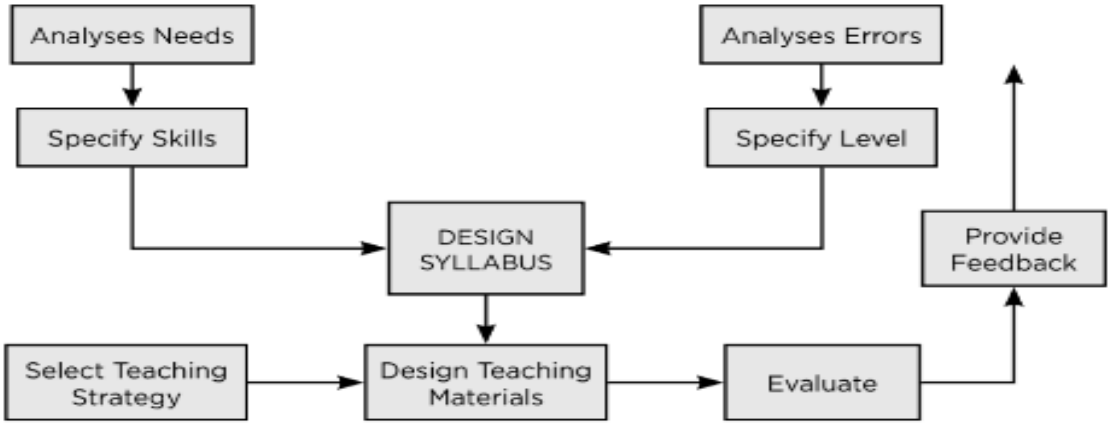
These data go through a set of categories in the communicative needs processor: first, describing the physical (time and place) and psychological setting where the target language will be applied; second, describing the social roles and relationships of the interlocutors in the intended interactions; third, identifying the appropriate communication instrumentality including the medium (spoken and/ or written language), the mode (e.g. monologues, dialogues) and the channel (e.g. online, face-to-face); fourth, determining the desired english language variety or dialect (America, British, Indian, etc); fifth, deciding the intended level of communication being it high or low (beginner, intermedite, advanced); fifth, determining the communicative event in which lannguage is to be used; sixth, determining the communication key through which communicative activities are conveyed (e.g. politely, directly); and finally, making decision about the linguistic proficiency as an output of the ESP course.

By the end of communicative needs processing stage, the findings would reveal the

Second, Bell's Syllabus Model (1981) is described by Yassi and Kaharuddin (2018). The model considers language as a social activity which enables the individuals and the whole group to communicate effectively through the acquisition of necessary language knowledge and skills. Therefore, the course designer needs to order the course contents and consider learners' fluency, accuracy and appropriateness while designing instruction for language skills.

Figure 63

Bell's Syllabus Model



(*Note.* Adapted from Yassi & Kaharuddin, 2018, p. 23)

Yassi and Kaharuddin (2018) interpret the model as follows. The designer gathers information about learners': background and readiness level (age, pre-knowledge, current language skills, target language learning main goals and desired time devoted for those goals); present competence level in the traget language (specifying error types and level of advancement). Those data would assist at designing a syllabus which provides the appropriate language forms and resources, teaching method, educational materials as well as evaluating the whole process and opening the door for any syllabus review.

2.3.4.2. Course Content

According to Basturkmen (2010), determining the content that should be incorporated into the course is a crucial aspect. She asserts that "a syllabus is generally organized in units. The units might be construed as areas of grammar and/or vocabulary, genres, language functions (speech acts), notions, skills or strategies" (p. 60) and that a course can cover a combination of types of units.

2.3.4.2.1. Types of Course Content

Based on the insights of the works of Dudley-Evans and St John (1998) and Belcher (2006), Basturkmen (2010) distinguishes between real content and carrier content. 'Real content' focuses on pedagogical aims including raising learners' awareness of language features and enhancing their language skills. 'Carrier content' refers to the means of delivering the real content 'e.g. texts, learning activities).

In this vein, Basturkmen presents a company's annual report as a carrier content that can be used in ESP class for financial accountants. The latter can be assigned to read the text and analyse the employment of terms like 'cash, capital and debt' or to discuss the meaning of the collocations entailing 'capital' such as 'capital expenditure' and 'capital raising'. Students can be engaged in a combination of tasks as carrier content. For instance, they can participate in an activity where they read company annual reports and take notes, and then organize them to deliver an oral presentation.

2.3.4.2.2. Course Content Items

The course is constructed by analyzing learners' specific requirements with targeted academic or occupational contexts and includes many items (Basturkmen, 2010). Those items can cover "skills, vocabulary, genres, functions, notions and disciplinary, professional or cultural content" (Basturkmen, 2010, p. 61).

Grammar

Woodrow (2018) states that , conventionally, grammar centers on syntax, tense and aspect, and syllabuses usually begin with the simplest forms of these and continue through to the most complex – for example, from the verb 'to be' and the simple present tense to the use of gerunds. As per her estimation, discourse analysis and diagnostic procedures like grammar tests can inform the decision of which grammatical items to include in an ESP course. More precisely, discourse analysis identifies common linguistic forms in the target context while diagnostic measures help identify areas of language and grammar that learners need to be included in the course.

Woodrow (2018) distinguishes between *traditional grammar* and *systemic functional grammar* (SFG). The latter is more frequent in ESP than in EGP courses. It takes into account the "communicative settings, register, genre and interlocutors in the language description" (ESP and grammar). In this context, this type of grammar deals with: "field (what's going on), tenor (who's involved) and mode (channel of communication)". Conversely, traditional grammar focuses on syntax, tenses, and syllabuses generally moves from the simplest forms to the most complex.

However, grammar is not always encompassed in the syllabus for a set of reasons Woodrow (2018). To begin with, some learners and teachers believe that emphasis on grammar is no longer necessary since learners have already attained the fundamental structures and rules. Next, decisions are made by ESP instructors about the inclusion of the necessary grammar forms in their courses depending on the requirements of the target communicative situations. Ultimately, ESP learners are frequently grouped based on their occupation or academic field of study rather than their competencies and level of advancement.

Functions and notions in language

Focus shifts from grammar to functions and notions towards the end of the 20th century. Woodrow (2018) depicts 'a function' as the language that is used to fulfill communicative goals. She cites White's (1988) examples of this intentional use of language such as greeting, giving instructions, inviting, apologizing, etc. She also labels 'a notion' as "concepts such as time, movement and cause" (ESP and functions and notions in language). Functions and notions have affected the ESP course design as they are used in daily communication.

Vocabulary

Woodrow (2018) indicates that "the important task for the course designer is to identify the vocabulary ESP learners need in order to communicate effectively in the target situation" (Vocabulary and English for specific purposes, para. 2). She differentiates between three categories of individual vocabulary items the mastery of which is vital for learners to effectively assimilate into the target community. Firstly, technical, specialist or specialized vocabulary attains to discipline-specific language that is not commonly employed or comprehended beyond that particular field. Secondly, the semi-technical or sub-technical vocabulary is used to convey a specific meaning or utilization depending on the field in which it is used. Last but not the least, general vocabulary refers to that used in everyday communication.

Woodrow (2018) also presents other types of vocabulary items, but as combinations of words rather than being individual. First to mention is *lexical patterning* which means words that frequently appear together. She also mentions collocations (words frequently fit each other, e.g. fast food, fast track), lexical bundle (units of language, e.g. Can I have? And I don't know). They can be identified through corpus analysis.

Concerning teacher's vocabulary knowledge, Hutchinson and Waters (1987) argue that teaching technical vocabulary in ESP is assigned to subject experts instead of falling under the purview of ESP practitioners. Woodrow (2018) states that the latter's' responsibility is guaranteeing the mastery of a specific discipline fundamental technical and semi-technical vocabulary, and hence, they are required to understand it. Course designers can rely on some sources of such vocabulary like vocabulary lists, subject dictionaries, subject specialists and corpora.

According to Nation (2007), four strands to teach a balanced vocabulary instruction are suggested: *Meaning-focused input* (reading and listening), *Meaning-focused output* (speaking and writing), *Language-focused learning* (linguistic study of item), and *Fluency-development* (as cited in Woodrow, 2018, Teaching Vocabulary, Para. 2).

As for how vocabulary is learned, Woodrow (2018) claims that comprehensible vocabulary acquisition can take place either unconsciously through exposure to language, such as through watching videos, or explicitly through the intentional acquisition of specific words or vocabulary sets. She considers some learning techniques to be introduced by ESP practitioners to aid students in acquiring vocabulary, including memory and retrieval methods (e.g. grouping words by meaning) and metacognitive strategies, which involve reflecting on preferred learning styles and developing a learning plan. She also cites Harding's (2007) proposal of adopting personal learning dictionaries where learners compile a list of the most significant words in their field of study along with related additional information.

Skills

Another aspect in ESP course content Woodrow (2018) tackles is skills. They are prioritized over linguistic forms since skills and texts are crucial to many ESP contexts, and are easier to identify. The author starts with 'writing' as a significant component of ESP and argues through the coming examples. The first instance to consider is that most academic

evaluations are conducted through written assignments. The subsequent point is that EAP puts a great emphasis on developing learners' writing skills through approaches that focus on technical accuracy, drafting and revising, genre conventions, and discipline-specific contextual factors.

Figure 74

EAP Receptive and Productive Skills: Some Examples

(*Note.* Adapted from Woodrow, 2018, Skills)

Reading is the second skill this author explains its status in ESP course design. In ESP, reading has undergone a shift from individual sentences to broad units of authentic texts. The coming is some features of ideal texts. In the first place stands their authenticity reflecting real communication of the target interlocutors. Following that, texts selection is done through cooperation with field experts. Lastly, Woodrow (2018) agrees with Hirvela

(2016) who interconnects reading into writing approach when designing a course. In other words, reading and analyzing discipline-specific texts then using them as models in students' written production. This acknowledges the reciprocal relationship between them in academic contexts. Considering reading comprehension within the framework of Bloom's taxonomy, Horváthová and Naďová (2021) claim that there are multiple points to be taken into account:

> Is reading and remembering the content from a text proof of sufficient comprehension? Are there other levels which need to be investigated? Is the expansion of reading strategies appropriate for adolescents? Are all students able to reach all levels of Bloom's taxonomy? By which strategies can we check their comprehension? (pp. 2).

Speaking is attributed a significant importance to speaking (Woodrow, 2018). One reason is due to the status of English as an international language and lingua franca. Emphasis is placed on effective communication in terms of accuracy and fluency regardless of being a native speaker. Exchanging information, ideas and feelings requires both speaking and listening. Woodrow (2018) distinguishes two types of listening: one-way or monologic like in lectures and presentations; interactive or dialogic such as in discussions and interviews.

Higher-Order Thinking Skills

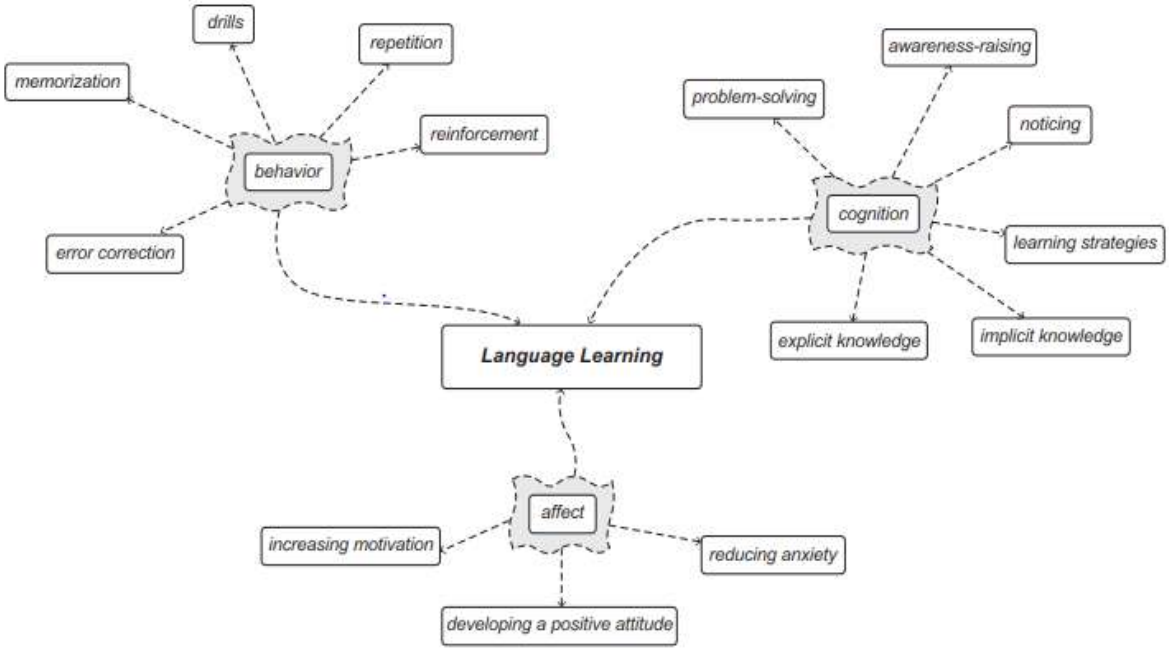
ESP goes beyond language to encompass some principles of research about learning theories and metacognitive skills development such as Pavlov's Behaviourist model (1897), Chomsky's mentalist approach (1957). It is interested in the learners' mastery of such skills or strategies to achieve certain learning tasks and enhance their understanding of the courses successfully. A case in point is the summarizing strategy which helps at understanding the message and forming a reply.

In the view of Beard and Hartley (1984), "students need to develop effective study skills if they are to become effective independent learners" (as cited in Jordan, 1997). He adds

that the traditional language four skills are sub-divided into micro-skills. Reading diverges into scanning, skimming, reading for details, viewpoints, concepts, etc. Speaking and writing involve competence in, say, summarizing and reporting. While learning, students are trained to develop cognitive skills through practice and tasks such as reasoning to solve problems and analyze information, critical thinking to evaluate viewpoints objectively, classifying, memorizing, etc.

Figure 85

A Model of Language Learning



(*Note.* Adapted from Anthony, 2018, p. 83)

2.3.4.2.3. Learning Activities in ESP Courses

Educational research has long considered teaching and learning activities as a fundamental cornerstone within the modern-day universities (Wang et al., 2013).Hutchinson and Waters (1984) state that any content or activity is integrated in the ESP course depends on "whether and to what extent it increases the efficiency and effectiveness of the ESP learning situation" (p. 111), instead of whether it is similar to or replicating the target situation. In the

same vein, Charles and Pecorari (2016) contend that the educational activities facilitate the fulfillment of the learning objectives.

Characteristics of the learning activities

Cowling (2007) claims that authenticity is a major criterion in the ESP course. He also states that authentic or realistic activities provide learners with opportunities to explore how their pre-existing language proficiencies can be altered according to the varied communication contexts. He illustrates the situation with the example of the Business Meetings module that would engage the learners at "completing a task in a meeting format and then the meeting would be evaluated and compared to transcripts/recordings of actual meetings of native English speakers tackling the same task" (p. 434).

Charles and Pecorari (2016) define an authentic task or activity as putting emphasis on fostering communicative objectives through meaningful interactions. They also describe an authentic learning activity as having measurable outcomes that reflect the level of target objectives achievement.

In the digital age, Problem-Based Learning can be employed to encourage learners to work in groups to search the web for sources, analyse research findings and utilize graphic software and presentation tools to prepare for presentations (Vavilina, 2020).

Examples of learning activities

Živković (2021) identifies questioning as an effective learner-centered exercise that prompts and guides learners' thinking and engages them in different cognitive activities such as interpretation, analysis, critique, and reflection. He uses Bloom's taxonomy model to develop students' critical thinking. The examples of the questions along with the learning objective verbs employed in the study about significance of critical thinking within the ESP engineering course are presented in the table.

Table 9

Examples of the questions and the learning objective verbs

Level 1: Knowledge	Level 2: Comprehensi-on	Level 3: Application	Level 4: Analysis	Level 5: Synthesis	Level 6: Evaluation
Learning objective verbs: arrange, define, describe, duplicate, identify, label, list, match, memorize, name, order, outline, recognize, relate, recall, repeat, reproduce, select, state Activities Some of the examples: How do you define engineering? Define a job of an engineer as a person trained and skilled in the design process Make a list of engineering branches Name job responsibilities	Learning objective verbs: classify, convert, defend, discuss, distinguish, estimate, explain, express, extend, generalize, give example(s), identify, indicate, infer, locate, paraphrase, predict, recognize, rewrite, report, restate, review, select, summarize, translate Activities Here are a few examples: Discuss an engineer as a practitioner Explain knowledge of two-dimensional (2D) and three-dimensional (3D) forms used in engineering Discuss how engineers use math and science Report recent achievements in engineering Identify a new approach in engineering design	Learning objective verbs: apply, change, choose, compute, demonstrate, discover, dramatize, employ, illustrate, interpret, manipulate, modify, operate, practice, predict, prepare, produce, relate schedule, show, sketch, solve, use write Activities Some of the examples are listed below: Write about technological advances Show the basic skills every engineer should have Demonstrate some of the engineering projects	Learning objective verbs: analyze, appraise, breakdown, calculate, categorize, classify, compare, contrast, criticize, derive, diagram, differentiate, discriminate, distinguish, examine, experiment, identify, illustrate, infer, interpret, model, outline, point out, question, relate, select, separate, subdivide, test Activities Some common examples for this level are: Analyze computational methods in engineering design Analyze an experience for the engineering design process Examine the needs to embed communication technologies in engineering	Learning objective verbs: arrange, assemble, categorize, collect, combine, comply, compose, construct, create, design, develop, devise, explain, formulate, generate, plan, prepare, propose, rearrange, reconstruct, relate, reorganize, revise, rewrite, set up, summarize, synthesize, tell, write Activities Here are a few examples for this level: Create your own logo for engineering Create a computer engineering program What would your advice be to future project teams	Learning objective verbs: appraise, argue, assess, attach, choose, compare, conclude, contrast, defend, describe, discriminate, estimate, evaluate, explain, judge, justify, interpret, relate, predict, rate, select, summarize, support, value Activities Below are some examples for this level: Determine your career goals Conclude about engineers as practitioners Argue about new ideas in engineering

(*Note.* Adapted from Živković, 2021, pp. 15-16).

Maley (2011) recommends the use of projects, extensive reading and writing, drama, community language-learning, etc with the purpose of offering learners opportunities to independently decide the content and language they need (as cited in Tomlinson, 2012).

2.3.4.3. Materials Selection

Tomlinson (2012) defines materials used for language learning as referring to the resources and tools that assist in acquiring language encompassing "coursebooks, videos, graded readers, flash cards, games, websites and mobile phone interactions, though, inevitably, much of the literature focuses on printed materials" (p. 143). Charles and Pecorari (2016) believe that the term 'material' can expand to cover written texts and language learning supporting tasks.

Instructional Materials and Needs Analysis

Johns and Dudley-Evans (1991) clarify that "throughout its history, ESP practitioners have been preoccupied with learner needs, with identifying learner wants and purposes as integral and obligatory elements in materials design" (p. 299). Along the same lines, Charles and Pecorari (2016) consider needs analysis significant "to the production of materialsince it is key to both their selection and their development" (p. 74). Additionally, they can be developed by the instructor himself, other colleagues in the institution or commercially produced.

Role of the Instructional Materials

ESP materials are designed according to specific teaching situations. They are vital at strengthening the uniqueness of ESP classroom instructions, content of instructions, and communication requirements. According to Phillips and Shettlesworth (1976), teaching materials are necessary at "creating the conditions for activities which encourage the student to transfer the language taught in the classroom to use in communicative situations" (p. 23). Moreover, Bhatia et al. (2011) notice that many novice ESP teachers lack the necessary

expertise in the target field of the learners, find some difficulty in understanding the content, and worry about the approach to depend on in educational materials selection.

Charles and Pecorari (2016) list the following advantages of using materials in EAP classes. Firstly, materials equip instructors with illustrative instructional language models accompanied with explanations and tasks and contribute to planning and structuring teaching and making it innovative. Moreover with regard to the learners, materials facilitate learning by breaking it into manageable chunks and raising self achievement sense, motivating and engaging them in the learning process, and encouraging autonomous learning with their variety.

Tomlinson (2012) depicts five roles the language learning materials can serve; firstly, informative materials supply knowledge and information about the studied language; secondly, they can be instructive, i.e. they aid learners in practicing and engaging in exercises of the target language; thirdly, experiential materials encourage the learners to witness authentic contexts of the target language; another purpose is eliciting which indicates motivating the students to actively communicate and involve in interactions using the studied language; finally, the exploratory aim of materials facilitates learners' uncovering the rules, aspects, patterns, etc of the target language.

For Tomlinson (2012), materials development encompasses "all the processes made use of by practitioners who produce and/or use materials for language learning, including materials evaluation, their adaptation,design, production, exploitation and research" (pp. 143-144).

Selection criteria of the instructional materials

Bhatia et al. (2011) consider materials selection as a crucial issue. They introduced two criteria through which materials are chosen and implemented regarding students' educational level: First, sophomores/ freshmen of any field need 'general ESP' materials

which emphasize general "skills such as listening to lectures, taking notes, understanding common structures of argumentation, supporting opinions with evidence, and representing abstract concepts visually using figures and tables" (p. 146); Secondly, Junior/senior studies require "traditional ESP" skills tailored to suit a particular field such as putting "focus on technical reading, writing, and presentation skills" (p. 146).

Hutchinson and Waters (1984) suggest that materials are selected on the basis of "how well and how far it develops the competence of the learner, rather than on the basis of the extent to which it mirrors the performance data of the target situation" (p. 109). That is, ESP course works to enable the learners to effectively conduct communication according to the particularities of the contexts they encounter.

Anthony (2018) explains that the materials employed in ESP courses may resemble either those used in the traditional GE classes and/ or specialist discipline materials. The most important factor to be considered in this case is that the chosen materials should meet students' needs. In this perspective, ESP teacher can instruct learners intending to become bilingual translators to translate a sentence or passage into their native language though it is a pure or common practice in Grammar-Translation classes as long as this practice serves the learners' needs.

Other characteristics have to be found in ESP educational materials. First, materials preparation requires appropriateness to the context of university branch, i.e. their content is relevant to the subject matter and includes its frequent language points. This is highlighted by Basturkmen (2010) affirming that materials "can sometimes be too complex, either linguistically or in terms of content" (p. 64) leading to student frustration and instructional ineffectiveness. According to Hutchinson and Waters (1984), the content of many ESP materials exclusively teach the target language and insufficiently represent the subject matter.

Second, materials have to be authentic, but with an appropriate level of complexity for the learners. Sometimes, they need to be simplified while keeping the target language phenomena or be adapted to their values. Therefore, Basturkmen (2010) insists that inaccurate and/ or oversimplified texts, videos, conversations and so on can be unproductive and incredible in the students' discipline. This also "overprotects learners and does not prepare them for the reality of language use outside the classroom" (Tomlinson, 2012, p. 161). Harding (2007) advises incorporating subject-specific contexts, texts, and situations, utilizing authentic materials, and designing authentic tasks that align with students' professional needs (as cited in Basturkmen, 2010). Consequently, two methodologies are suggested to guarantee making appropriate choice: First, it uses natural language; second, it prompts a range of communication skills. If the teacher is explaining an authentic text in English, the learners are expected to take notes (communication technique). Thus, this practice would motivate students to engage in real-like communicative situations.

Basturkmen (2010) claims that "one of the key characteristics of ESP is that teachers and course developers value the use of authentic texts and tasks" (p. 63). Further, she defines being 'authentic' as the selected texts are not originally generated for educational purposes, for instance, using a text produced by accountants in financial accountants course to assign learners to identify and communicating economic ideas or read it to report the activities of companies. Additionally, these authentic materials demonstrate real language use. A fact that Woodrow (2018) supports stating that "the most important aspect of ESP materials is that they reflect the target communicative situation" (What are ESP materials?). Swales (2009) claims that finding ideal texts by EAP practitioners for their classes and workshops is time consuming and labour-intensive, and they can resort to editing as a solution when the existing material is ambiguous or inappropriate for the target audience (as cited in Basturkmen, 2010).

Similarly, Charles and Pecorari (2016) spark inquiry concerning the nature of

'authentic' materials and their usefulness as well as disadvantages in the learning environment. They find that authenticity is matched to teaching language for the purpose of communication. Supporters of using authentic materials present two arguments: First, constructed texts may encompass features that are overrepresented, underrepresented, misrepresented or completely absent as opposed to authentic texts. Accordingly, students may only have access to materials related to their disciplines at the university, so the discourse has to reflect the learners' real-world communicative requirements. At this point, critics argue that authenticity is not the only standing criterion to ensure the appropriateness of teaching materials to the learning objectives, but rather they require other features such as being contextualized within the classroom situation. Critics also indicate that the search for suitable authentic materials exemplifying the genre and linguistic structure of the desired language can prove to be highly difficult and time consuming. Additionally, the constructed texts or non-authentic texts expose learners to a rich abundance of instances of the targeted feature being studied.

Besides authenticity, Charles and Pecorari (2016) introduce another aspect advocates of authentic texts point to is its potential of motivating learners. This happens when learners have determined academic objectives since the beginning, and hence, recognize the direct relevance of the texts in their disciplines. Opponents on their part claim that incorporating authentic texts can be demotivating and discouraging especially for those with low proficiency level or pre-study students who may be without the necessary disciplinary foundation. However, proponents see it positively as it raises learners' awareness of the required level of English as well as fostering their skills to meet those requirements. Adapting the teaching practices to the learning setting the solution proposed by Charles and Pecorari (2016); authentic materials have to be selected according to the learners' interests, objectives English level, academic scenario along with the teachers' methods of text employment and

adaptation degree. They offer an example of "a reading text that is beyond the vocabulary level of the students can be read for gist, encouraging the students to guess the mean-ing of unfamiliar words" (p. 76).

Types of Materials in ESP Courses

In general, Charles and Pecorari (2016) divide materials into two types 'commercial (or published) and self-developed'. Charles and Pecorari (2016) tackle a set of arguments for and against textbooks use in classes. In the same vein, Tomlinson (2012) also states that there have been a long debate about the value of textbooks as a medium for delivering language-learning materials.

Figure 96

Examples of Authentic Materials

- Research article
- Video of a lecture given to master's students
- Undergraduate essay
- Recording of student chat before a class
- Email apologizing for arriving late for a seminar
- Instructions for an examination
- Twitter feed from an academic conference
- Article from a science journal for non-specialists
- Blog post on a specialist subject by a well known and respected academic professor

(*Note.*adapted from 'Task 1 Authenticity and suitability', Charles & Pecorari, 2016)

Arguments against Textbooks

Tomlinson (2012) collects some of the arguments of those opposing the use of textbooks; they limit the independence and power of both teachers and learners as they fail to consider the needs of the learners and they are employed as a tool just to keep order; additionally, textbooks imposition of a standardized syllabus and teaching approach poses constraints for instructors to employ them flexibly; they do not consider language points

deeply; furthermore, loss of teachers' innovation and initiative may be the consequence of overreliance on these materials. Furthermore, Tomlinson (2012) highlights the findings of the studies comparing corpora from coursebooks and others form authentic interactions criticizing the former's inadequate representation of authentic language.

Charles and Pecorari (2016), on their side, cite some scholars who criticize the use of already prepared textbooks and present the following arguments: First, the language included in textbooks is significantly different from the authentic language of academic setting and misleads both teachers and students. Second, textbook authors can have weak linguistic and pedagogic background and focus on commercial success over valid pedagogic contribution in their fields.

Arguments for Textbooks

Charles and Pecorari (2016) summarize the following pro-textbook views. The first point to mention is that textbooks most often result from a thorough research and cooperation between instructors and publishers. Next, they save teachers' preparation time and burden through supplying ready syllabus and content. Moreover, they can be freely adapted according to the learning context trying to take the full advantage from them without being constrained by every detail. Lastly, they can foster educators' professional development through modeling novel approaches and innovative activities.

Tomlinson (2012) adds other advantages for the textbook; first, it equips educators with valuable instructional materials for planning lessons; moreover, it supports the administrators at guaranteeing course credibility, arranging lesson schedules along with establishing standardized teaching methods; moreover, it offers students with a feeling of confidence in what they study, organization, advancement and opportunities for revision.

Methods for incorporating instructional materials in ESP courses

– **First, evaluating and selecting published materials**

Charles and Pecorari (2016) propose an evaluation checklist which considers the needs of all users of the materials encompassing instructors, students, institutional personnel (e.g. heads of departments) and members of community (e.g. education ministry). It consists of two stages: ‘an initial evaluation’ discarding the least probable materials through asking questions about the adequateness of the materials with the determined learners’ needs, their level suitability, etc; then, ‘an in-depth’ evaluation to narrow down the number of viable options from the remaining possible materials relying on criteria such as level of consistency between learning objectives and materials, types of the educational activities, etc.

- **Second, Materials adaptation**

A widely discussed topic is generated around the integration of authentic materials in both “EGP and ESP is whether the texts selected should be used as they are or whether the texts should be adapted to meet the linguistic level of the students. Lower-level learners may find authentic ESP texts too complex” (Woodrow, 2018, Authentic materials). Aiming at closely aligning materials to the educational context, McDonough, Shaw and Masuhara (2013) name five sorts of adaptation which are *adding* (offering more or new materials e.g. adding a new vocabulary task to the pre-reading phase*)*, *deleting* (removing tasks, units, etc), *modifying* (causing some change like rewriting the content, restructuring tasks instructions, say, from being individual tasks to a group work), simplifying (frequently concerning lowering language level of texts) *and reordering* (changing the sequencing of units, tasks, etc) (as cited in Charles & Pecorari, 2016).

According to Tomlinson (2012), skilled teachers continuously tailor the employed materials to comply to each teaching context and to ensure compatibility between the materials, teaching methodology, learners' needs and abilities, learning objectives, the target language being taught, and the teacher's own personality and teaching style.

– **Developing one’s own materials or Materials Production**

In case no fitting material is obtainable after a thorough evaluation of the existing ones, creating one's own materials becomes a must. Charles and Pecorari (2016) describe the process of generating educational materials and cover the following stages. The first stage, deciding a general approach, decisions have to be made concerning the pedagogical approach (e.g. traditional presentation-practice-production framework or as in our research modern approach of flipping the ESP class), learning objectives (e.g. practicing a particular skill) along with the target outcomes and the time frame. The second phase entails planning materials in a well-structured and sequenced way. It requires considering specific details about the intended content's linguistic and cognitive complexity in order to grade and organize the materials efficiently, and hence, supporting progressive learning. The third stage -research the area- involves gathering information through approaches like genre and corpus analysis and delving into the subject matter to be taught such as lexico-grammatical items. In the fourth stage named 'construct the material', all necessary information is there and it is time to use them to write the materials. Some criteria should be taken into account, such as tasks meaningfulness, clarity and easiness of instructions, conformity to the learning objectives as well as consideration of their emotional and cognitive level. The fifth and last stage requires piloting and evaluating the produced material. After integrating and testing them in class, feedback is gathered from both instructors and learners through interviews or questionnaires then recording any important data in a reflective log. Consequently, improvements can be applied to the designed material.

For Marjanovikj-Apostolovski (2019), materials development and customization are key characteristics of ESP courses mainly because of its specificity of tailoring educational materials to comply with the unique needs of particular students groups and the appropriate already published material is highly possible to be unavailable.

On the whole, materials have to consider the learners' perceptions of their professional and academic future, language expertise and background, notions about vocational and social expectations. For our study, we are not going to select or prepare materials that are suitable to all Hydrocarbons Faculty at Ouargla University including the branches of oil drilling and production in general, but only for the oil drilling students. In addition, the chosen materials should take specific account of the social and cultural aspects related to a Muslim Arabic-speaking society. In this way, they are supposed to be more appropriate and acceptable to the learners there.

The ESP practitioner has to look for the suitable resources for the level of the learners based on their already analyzed needs. With the technological advancement, a plenty of resources are available on the net being them textbooks, worksheets, audio, videos, etc in addition to the instructor's personal effort who decides about the preparation and employment of individual, pair or group tasks.

The researchers will do this task though they not familiar to oil drilling major of the learners. They base their work searching the net for resources, consulting specialist informants or experts, and looking for textbooks, journals and any other sort of useful sources matching to the target genre and required skills. The content is characterized with its clarity and logic in the sequencing of learning objectives and items with opportunities to practice and learn with fun and interest.

2.3.4.4. ESP Teaching Methodology

In the perspective of Nunan (1988), methodology facilitates teaching through designing and organizing the learning tasks to accomplish the intended learning objectives (as cited in Agustina, 2014). The predominant and widely accepted methodologies are mainly communicative language teaching and task-based learning in English for General Purposes (Van den Branden, 2012as cited in (Woodrow, 2018,Appropriate teaching methodology).

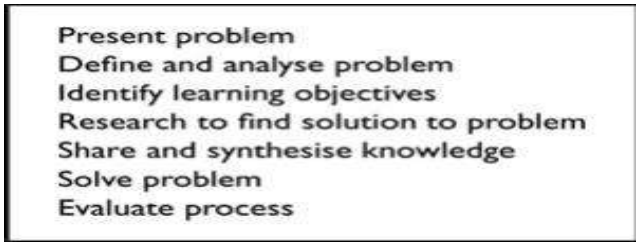
ESP Teaching Approaches

By its emergence, ESP was seen as needs- and materials-led and did not own a specific teaching methodology; nevertheless, an interest in this issue has started to increase with the emphasis on learner-centeredness trend (Johns & Dudley-Evans, 1991). Johns and Dudley-Evans (1991) assert their belief that "ESP requires methodologies that are specialized or unique" (p. 305). Accordingly, some examples are given; EAP necessitates collaborative teaching technique by both an English language instructor and a subject-matter lecturer; by incorporating genre analysis and the social constructionist perspective of writing into ESP teaching methods, teachers are equipping their students with the needed tools to successfully communicate in their specialized fields and develop their writing and socio-cultural skills.

Conversely, Woodrow (2018) believes that ESP does not necessarily employ pedagogical approaches that are unique or specialized, but rather they are commonly utilized in teaching other academic disciplines. She defines some of these methodologies, describes their stages and their implementation ways.

Figure 107

Typical Stages of Problem-Based Learning



(*Note.* Adapted from Woodrow, 2018, *What is Problem-Based Learning (PBL*)?)

First, *problem-based learning (PBL)* appeared in the 1970s and prioritized the learners over the subject matter. It is commonly used in medical training, and hence, in medical ESP. It is based on the concept that "learning occurs during the process of investigating and producing a solution to a problem" (Woodrow, 2018, What is problem-based learning

(PBL)?). It aligns with some principles of EFL like collaborative-learning and task-based learning methodologies.

The implementation of PBL may not be appropriate in every educational environment. The main challenge may rise from the difficulty of establishing collaboration due to the differences in the epistemological views between ESP educators and subject specialists Woodrow (2018).

Second, *case-study approach* is similar to PBL in both being learner-centered in essence, collaborative in approach and problem-solving in objective. It varies from PBL in being typically applied in business along with the number of considered solutions provided for the given problem. It is relatively complex as it relies on multiple data sources and documents to gather data usually to describe a problem or situation in a company simulating a business-meeting model. There exist four types of it: The Harvard approach to case study (using a narrative to convey information about a particular situation, problem or event), the abbreviated case-study approach (presenting a shortened version of the situation), an open case study (searching extra information by students to complete a task) and a closed case study (providing all necessary information to students doing a task). Table 11 depicts the procedure of a case study.

Although it presents some challenges when implemented such as difficult assessment of students and long complicated cases, it also possesses some advantages. They are summarized by Woodrow (2018); Case study approach develops the skills of communication, decision-making, leadership, independent thinking. Additionally, it bridges the gap between business theory and practice through supplying practical application opportunities in a supportive space with access to a wide variety of grammar and vocabulary.

2.3.4.5. Assessment Forms in ESP Course Design

Assessment is defined as "the evaluation of a student's achievement on a course" (Agustina, 2014, p. 59). It is presented as "the ways used to evaluate information about a learner's language ability or achievement" (Hyland, 2006, p. 99). Boulton and Lewis (1995) sustain that carefully planned, effectively communicated, and well-implemented assessment procedures are essential in the learning environment; hence, they should be designed to not only support, but also recognize the development of the learning aspects that foster higher-order thinking, if their achievement is the desired result. Thus, assessment has two roles: a teaching role through enhancing the students' mastery of their skills and comprehension of the presented knowledge; and a testing role by serving as a tool for educators to inform students about their areas for improvement and difficulty (Hyland, 2006).

For Agustina (2014), a good assessment presents learners with activities and situations where they would use real-like language. Moreover, assessment forms have to depend on the analysis the specialist discourse and knowledge of the learning and target situations.

Forms of Assessment

Charles and Pecorari (2016) confirm that "the form(s) of assessment should measure attainment of the learning objectives" (p. 66). They see a need for making some decisions about assessment during planning for a course being it formal (e.g. providing standardized test scores from students) or informal (e.g. carrying out admission interviews). They give some examples of assessment forms such as tests, written assignments, oral presentations, etc.

Criteria of Quality in Assessment

An effective assessment is characterized by: "alignment, validity, reliability and predictability" (Charles & Pecorari, 2016, p. 170). First, constructive alignment entails setting a link between the learning objectives, the content, and the assessment forms; the defined

leaning objectives are used to determine the content to be taught while assessment evaluates the level of attainment of those objectives. Second, a valid assessment requires measuring what it is intended to measure and giving meaningful results, for instance assessing fluency in a business meeting task. Third, reliability implies consistency among results; for example, a teacher's objective is to get Business English students deliver professional presentations, so an assessment is designed to evaluate their presentation skills. Fourth, predictability supports learners with clear and transparent information about the assessment right from the beginning of a course. Therefore, they would understand clearly what to prepare and perform. A case in point is supplying students with samples of the past assessments.

2.3.4.6. Evaluation in Course Design

Evaluations are seen as "valuable tools, as they provide indications of ways in which a course can be developed and improved" (Charles & Pecorari, 2016, p. 70). Putting it differently, the process of evaluation helps the ESP practitioners to collect sufficient information about their own performance, success of the course and the extent to which the learners have reached the course objectives.

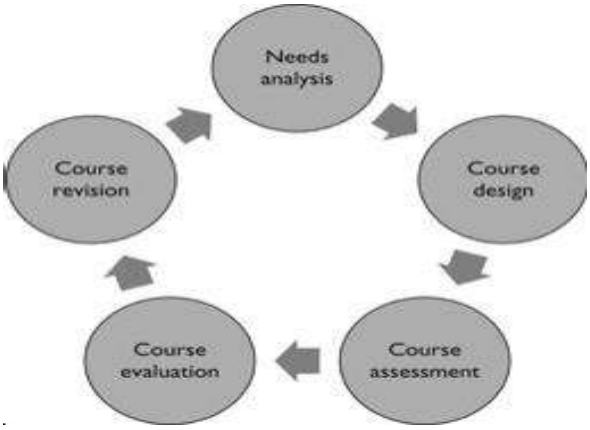
Bhatia et al. (2011) state that testing requires a special attention; "when ESP is adopted at the program level, all teachers need to both teach and test a core set of goals" (p. 147). They insist on determining the procedures and content of testing within a 'centralized, standardized test' or a provided 'sample test questions, materials, and grading rubrics'.

Dudley-Evans et al. (1998) claim that evaluating the course design and educational materials should take place during, by the end of, and after the end of the course. Moreover, they insist on having such follow-up with students "to assess whether the learners have been able to make use of what they learned and to find out what they were not prepared for" (p. 17).

Dudley-Evans et al. (1998) suggest some of forms of course design evaluation: firstly, by means of regular 'needs analysis and discussion', syllabus can be adjusted to meet changing requirements; secondly, 'negotiation' with learners about their attitudes towards the course, needs and priorities from which the next course step departs.

Figure 118

Course Design and Assessment Cycle



(*Note*. Adapted from Woodrow, 2018, *Evaluation Chapter)*

Evaluating the Course

Woodrow (2018) through course evaluation, educators can gain insight into the effectiveness of the ESP course and determine areas that require enhancement. "In many settings, teachers are required to give students the opportunity to evaluate a course" (Charles & Pecorari, 2016, p. 70). Various methods can be employed to collect data on student satisfaction with the ESP course, including the use of questionnaires or interviews during or by the end of the course Basturkmen (2010).

Basturkmen (2010) adds that evaluating learning in ESP courses entails ongoing revision depending on evaluating the effectiveness of the current version. It can be done through Wray and Gillet's (2006) procedure of evaluating pre-sessional EAP courses and programmes in university settings or through Atherton's (2006) mixed methods comparing students' entry and exit test scoring outcomes, an end-of-course questionnaire for learners

providing self-assessment of course objectives attainment and the ‘acid test’ involving sending a post-program questionnaire to students months after completing the EAP program to assess their perceived performance upon joining their academic programs.

Basturkmen (2010) also mentions other studies aiming at evaluating courses. For instance, Ridley (2006) seeks any correlation between the students' exit scores on the pre-sessional course and the duration of time it took them to finish their academic studies. Another example she includes is Martala’s (2006) evaluation of a pre-sessional EAP program's writing component for Chinese students entering postgraduate studies, utilizing five questionnaires and samples of students' writing to assess their prior writing experiences, self-assessment of learning growth, and overall course contentment, along with analyzing written assignments from the pre-sessional program and initial semester of their degree programs.

According to Boudersa (2018), the success of the course is determined quantitatively by counting the number of the learners having it and completing it efficiently. This can also be proved qualitatively by administering a survey and collecting information about its usefulness, length, joyful tasks, learners’ motivation and engagement, etc.

In the same vein, Woodrow (2018) presents student questionnaires among a variety of data gathering tools to collect information about their satisfaction with the ESP course. She claims that these methods should be precise and have practical outcomes which can be relied on to ensure improvements, and hence, course efficiency. Charles and Pecorari (2016) mention tools such as anonymous student comments on a course, teaching peers’ and directors’ classroom observations.

Generally speaking, course evaluations take place at the end of a course, however a necessity for evaluation rises throughout the course to detect and tackle any issues affecting the value of its remaining part (Charles & Pecorari, 2016). Instructors can dedicate time throughout and after the course to draw on a feedback on the course strengths and the

weaknesses needing remediation (Charles & Pecorari, 2016).

Evaluating Teacher

As one of the aims of modern teaching approaches, learners can be cooperative at evaluating their teacher and course. A questionnaire, for instance, about learners' attitudes towards a course can reveal significant data on teachers' effective performance such as appreciating the smooth teaching method and the excessive number of homeworks (Basturkmen, 2010).

Evaluating Materials

Evaluation of materials in ESP has become interesting for many researchers (Basturkmen, 2010). It is "an in-depth" and "a coherent, systematic, objective and credible activity" (Bocanegra-Valle, 2010, p. 149). It employs questionnaires, checklists in the first place then followed by interviews, observations, pilot testing, rating scales, etc.

According to Bocanegra-Valle (2010), Chan (2009) uses a six-step model consisting of two parts: Part A about pedagogical issues in ESP courses which are needs analysis, learning objectives, teaching approach, authenticity of the language, contextualization of the language, and learner's autonomy; Part B tackles specific subject matter and can be used as a guide for other studies.

To sum up, learners' needs, course objectives and content, instructional material and method, assessment method, and educational approach used by the ESP teacher are crucial elements that assist at an in-depth understanding of the ESP practices in each specialized discipline (Boudersa, 2018). Conducting a NA, designing a course, and preparing the teaching materials are necessary stages for ESP practitioners to be confident enough of raising the course effectiveness.

Conclusion

Providing a course that is based on students' needs and objectives is ESP's greatest strength. Nevertheless, many EAP programs are characterized by "the absence of dialogue between students and teachers over students' reactions to classes, assignments, and textbooks, and the exclusion of possible participation by students in curriculum development and pedagogical decision-making" (Khany & Tarlani, 2016). In relation to Algerian universities, the prevalent policy through which curriculums are built and taught is monologic. To get rid of those flaws and positively change the current situation, both teachers and students have to bear the responsibility of course content requirements. To that end, seeking an efficient teaching model becomes a necessity. Hence, flipped classroom (FC) seems to guarantee students the chance to comply, resist and give feedback about the teaching methods and course content immediately after each session assuming them active roles instead of being passive observers. This study implements FC model to teach English for oil drilling students and evaluates its effectiveness at fulfilling that purpose. Before proceeding to FC approach implementation methodology and findings, the next chapter addresses the details related to this pedagogical framework.

Chapter Three

Chapter Three: Flipped Classroom: An Educational Model

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Introduction

In a globalized world dominated by professional opportunities, educational institutions work to improve the learning processes through integrating effective tools and encompassing new skills to address the requirements of the current situation. New didactic models depending on modern technology like social media and web 2.0 tools are tested in the educational domain to take the full advantage of them. Varying educational approaches, technological instructional materials, learning activities, and assessment methods are affected by the circumstances of a particular society and era of their emergence (Anderson & Dron, 2011). In the perspective of Živković (2021), education causes transformation that goes beyond the classroom to foster a society that embraces self-transformation. That is, individuals appropriately apply the knowledge and skills they acquire at educational institutions to new situations with the aim of fostering the skills of "self-direction, creativity and the critical analysis of problems requiring a solution" (Jonassen, 1994, as cited in Živković, 2021, p. 17). Živković (2021) affirms that "the 21st century learning environment needs students to be engaged in higher-order thinking skills – creativity, innovation, communication, collaboration, critical thinking and problem solving" (p. 18).

Increasing learning opportunities are provided by the widespread connectivity and abundant information outside the physical classes and scheduled education times, along with efforts in adjust those opportunities to individual needs (Pegrum et al., 2014). This was due to the influence technology has on the ways of communication, teaching and learning (Healey, 2016, p. 17). Additionally, the concept of literacy transforms to have multifaceted literacies. Among them is the digital literacy which is defined by Bloch (2013) as being able to communicate using multiple channels and methods (as cited in Woodrow, 2018,). Therefore, academicians believe that learning modalities have to be adapted to align with the demands of the digital age (Cowie & Sakui, 2013). In this research, Flipped Classroom Model is under

focus as a case in point.

One of the areas being affected by technological advancement is the teaching of English for Specific Purposes (ESP). Bhatia et al. (2008) affirms that language education becomes a project for countries to invest in its individuals to be competitive in an increasingly complex and dynamic world full of globalized occupational opportunities. This is reflected in influencing the key aspects of ESP, notably professional settings and academia, and hence, technologies can enhance ESP course design, materials, and organization constantly (Woodrow, 2018). However, Vavilina (2020) claims that "the potential of virtual reality learning environment for an enhanced ESP classroom is yet to be explored (p. 169). She adds that ESP enhancement requires teachers to emphasize the common aspects between digital literacy and traditional knowledge and skills, coupled with their capacity for creativity and innovation. In the multilingual Europe, technology causes challenges to ESP teaching with the changing teacher-learner roles, adoption of English as a medium of instruction (EMI) and the augmented focus on specialized language content (Vavilina, 2020). The previous context resembles what occurs recently in the Algerian higher education, the focus of the current study.

Drawing from the insights of the preceding details, there must be a set of characteristics for a course or an academic program to be designed and delivered. It has to meet issues of learning outcomes and curriculum, address the appropriate content and the way to be conveyed in. The effectiveness of educational approaches, being them fully online or blended or face-to-face, require to meet a set of curriculum and pedagogical aspects, mainly learner differences, learning output, teaching preferences encompassing the employment of technology and instructional delivery methods. Thus, because there is no already existing or published English for oil drilling course using flipped classroom, this study serves as an attempt to fill this gap.

In Algeria, the spread of Covid-19 Pandemic has put a great emphasis on the importance of integrating online education in general and FCM in particular in higher education since 2019. Another point to be considered in this study is its shift to the incorporation of English as a Medium of Instruction. In the current study, the implementation of FC in ESP classes seeks to depict the quality of academic performance and student satisfaction with modern teaching models.

3.1. Impact of Technological Advancement on Higher Education

Technology incorporates a variety of multimedia forms including texts, videos, images, animations and sounds, played or displayed on mobile devices (e.g. smartphones and tablets) to vary teaching techniques, meet different learning styles and allow learning anytime and anyplace . The recent years have witnessed revolutionary progress in language learning through the adoption of modern technologies (Tomlinson, 2012). In the same vein, Pegrum et al. (2014) state that "the impact of new technologies on language learning is enormous and rapidly changing, requiring both educators and students to acquire new skills and strategies to access the potential that these tools can offer them" (p. ix). However, this technological advancement has advantages and drawbacks when integrated in higher education.

3.1.1. Advantages

Charles and Pecorari (2016) state that technological developments have revolutionized communication and the creation of educational material. Vavilina (2020) affirms that ESP teachers become able to improve their teaching practices by discovering the ways digital skills relate to traditional literacy skills. By understanding the key features of digital literacy, ESP teachers can leverage technologies' fullest advantage to create a more effective learning environment.

Charles and Pecorari (2016) identify two advantages supplied by technology in EAP classes. First, it is used to discover and access content. The Internet provides a wide variety of

materials compatible with the requirements of EAP classes. It also widens the opportunity to access authentic materials and learn autonomously through direct contact with experts of the target discipline. It provides learners with opportunities for innovatively creating, widely sharing and immediately responding to content through virtual learning platforms, social media, blogs, etc. The second advantage of integrating technology in language classes is assisting to produce resources and practise language.

Kessler (2016) depicts a set of standards set by UNESCO to be adopted by educators as guidelines for integrating ICT to foster the educational process all over the world. Those standards for teachers focus on: Facilitating student learning and innovation as instructors employ their proficiency in subject matter, instructional strategies, and technological tools to create learning experiences in both face-to-face and online settings; Designing and creating learning experiences and assessments aligning with the digital age through incorporating technological instruments and resources within relevant contexts to increase content acquisition; Modeling digital age work and learning through showcasing knowledge, skills, and work processes in their profession in a global and digital society; Advocating for and leading by example citizenship and responsibility relevant for a digital world through providing opportunities to navigate the net safely and responsibly; Pursuing lifelong professional growth and leadership ability utilizing digital tools and resources within educational institutions and community of practice.

Likewise, Woodrow (2018) outlines a number of tech incorporation benefits in classes. Learning Management Systems (e.g. Blackboard or Moodle) are instances of facilitating course delivery. Tech makes assessment rapid, low-cost and objective, despite the possible objectivity challenges related to assessing communicative practices such as speaking and listening. Healey (2016) affirms that the learners, who have been raised or grown up in the presence of mobile devices, are naturally assuming the aptitude for sharing information

because of their familiarity and knowledge with the accessible social networks, and hence, requiring little encouragement to be engaged with language learning opportunities.

The variety of tech materials allows teachers' expansion of textbooks content with technology. According to Motteram (2016), instructors can enrich textbook content with technology integration. Instances can encompass pre-session preparation or reviewing of the session's content in advance, supporting learning with assigning activities on the web, offering opportunities of real communication online with native speakers or learners of English from all over the world, hosting guests in classes via Skype or Twitter. Additionally, digital materials attract students as they make textbook materials more realistic and keep them up-to-date.

Davies (2002) highlights the contribution of the Web to education through developing the concepts of distance learning and New Learning Environments (NLE). The latter are based on fostering autonomous learning, providing opportunities for distance learning, encouraging life-long learning while assigning the facilitator role to the teacher. Further, the web enables language teachers to carry out research that was impossible before its advent, find reference materials and deliver their lessons content more effectively.

3.1.2. Challenges and Compromise

Incorporating technologies in classes is not an easy task. Anderson and Dron (2011) list a number of the challenges facing their integration. E-learning models implementation is determined by the presence of appropriate technologies, for example, conversation-pedagogies are hindered with the absence of two-way communication channels. Additionally, conferencing tools are requiring by the expenses providing its infrastructure, software and hardware, connectivity availability, along with the complexities in implementation such as the necessary technical knowledge, user training, security and confidentiality, etc.

As far as the challenges of integrating technologies in classes are concerned, Healey, (2016) states that selecting the appropriate content is a difficult task. This is due to its extension from the subject matter and covering the genre along with academic discourse features such as technical vocabulary. For instance, TED talks present valuable innovative content but for a general audience not targeting specific academic disciplines. Creating an effective course proved much more difficult than just uploading PDFs to a website, possibly less specialized and formal (Charles & Pecorari, 2016).

The restrictions of governments of blocking access to some websites and content providers (e.g. Google tools and YouTube) have posed difficulties for both instructors and students to rely on those beneficial language learning resources (Healey, 2016).

Another drawback emerges from acknowledges the potential downsides of connectivity Healey (2016). Firstly, the pop-up ads displayed by the websites are commonly difficult to be skipped and occupy the entire screens. Secondly, users' data gathered by apps when they connect or sign in associated with their passwords and social relations can be exploited negatively by malicious apps. Thirdly, learners' privacy can be violated through accessing their personal contacts like phone numbers and emails. Lastly, cyberbullying is another online threat which indicates spreading online viral content. Kessler (2016) draws attention to the risks students' security which may face using social media.

Davies (2002) highlights the critics to the impact of the Web on higher education regarding the diminishing of traditional educational environments along with transforming the universities into 'Digital Diploma Mills'. This has led to depersonalized learning experiences, deconstruction the sense of community, emphasizing quantity over quality through making education accessible to a large mass of learners and offering diplomas without any specific standards to guarantee an efficient level, etc. These 'diploma mills' are criticized for lacking physical learning spaces, employing untrained or non-existent staff, or being controlled by

dishonest people driven by personal gain.

Next, Davies (2002) moves to Press and Washburn's (2001) 'Digital Diplomas' paper where they raise the question of the value of diplomas granted by online platforms dot-com institutions in an attempt to highlight the shift towards the increasing commerce-focused and consumer-oriented trend in higher education. Further, Davies (2002) raises fears about the following issues: first, exclusive delivery of complete courses via online platforms deprives young learners from moving outside houses, studying and joining societies, taking part in clubs and parties, traveling; second, the risk of creating a screen-focused generation with overreliance on e-learning instead of ensuring self and societal progress; third, over-emphasizing e-learning leads to training with its short term objectives rather than education involving personal development for lifelong purposes; fourth, doubts about the employability of graduates with e-languages diploma raises doubts about their qualifications without having any prior face-to-face immersive experiences with native English speakers; Lastly, learners' language proficiency is typically assessed in controlled environments which is doubted to be possibly achieved with e-learning.

Tomlinson (2012) also outlines the main concerns raised by some researchers about the potential dangers associated with excessive dependence on electronic methods and channels to make learning content accessible for the learners. Those risks indicate that the idea of using multimedia technology does not automatically lead to efficient education, but can rather limit the flexibility of the teaching process. Moreover, educators have to consider the appropriate implementation of technology rather than just incorporating it in their courses.

Balancing the flaws and advantages of e-learning, it is recommended to embrace hybrid approaches when designing online materials (Davies, 2002, Felix, 2001) This can be applied by integrating different teaching techniques and technological tools. This approach can assist at preventing or minimizing potential technical issues. For instance, downloading

web tasks onto personal devices can help bypass limited or unavailable Internet connectivity in traditional classrooms. Additionally, merging audio or video conferencing with web activities can support online interactions, mainly discussions and presentations. In the same vein, Motteram (2016) suggests requirements to enhance the quality of teaching using technology. Instructors need to actively evaluate the ways educational materials are produced and determine the criteria of creating their own. This would assist teachers at searching for and using effective materials rather than being limited to textbooks. That is, the key aspect of integrating materials is not just for being technologies, but rather their assessment for selecting the most efficient. In addition, as higher education students are no longer limited to a single physical classroom on a set schedule, teachers have to adapt their learning practices and spaces to ensure learners engagement via using various devices and platforms in flexible learning environments (Chen et al., 2014). Vavilina (2020) affirms that ESP teachers not only have to tackle the difficulties caused by the impact of technology on communication and work culture, but also navigate significant transformations in the higher education landscape.

3.2. Definition of Online Education

According to Holm et al. (2022), the advent of COVID-19 pandemic has required many teachers any of the digital teaching modalities to adapt their instructional methods to the newly created situation. To that end, online education has been opted to in order to prevent a complete halt of studies. Drawing from the insights of several scholars, it is defined as “access to learning experiences via the use of some technology” (Moore et al., 2011, p. 131). It is also referred to as “online, web-based, and e-Learning” (Moore et al., 2011, p. 131).

Cowie and Sakui (2013) define the term e-learning as referring “to language teaching and learning using digital devices such as computers, tablets, and smart phones” (p. 460). They affirm that e-learning is universally recognized as an accepted form of learning. They also introduce a number of its names, including ‘technologically assisted language learning’

and ‘computer-assisted language learning’. Sangrà et al. (2012) contend that the term has been labeled under other names like “computer-based learning, technology-based training, and computer-based training” (p. 146). In general, it refers to the integration of information and communication technologies in education. The implementation of this type of learning requires teachers’ e-learning expertise in order to provide efficient opportunities for academic development (Cowie & Sakui, 2013).

Vai and Sosulski (2011) outline a set of characteristics of online learning differentiating it from onsite learning. First, lectures are delivered or received via online channels instead of physical teaching settings. Second, instead of in-person traditional classes’ interactions, individuals can communicate on a one-on-one level using digital technologies. Third, time of online learning adjustment is discussed and determined by the teacher and the learners, rather than conventionally scheduling a program based on the decision of the teacher or administration. Additionally, online classes emphasize class participation and engagement rather than the onsite in-person attendance. Another feature these authors shed the light on is the innovative ways of assisting struggling learners and clarifying any misconceptions provided by the online learning. This can be done by scheduling online meeting using digital tools, instead of the traditionally extra face-to-face help.

Recently, different concepts have appeared to be related to current online learning types. Vai and Sosulski (2011) depict them in as follows. To start with, synchronous or real time learning entails that the teacher communicate with students within the same time frame. Conversely, asynchronous learning is described to be more flexible than the preceding type. This means communication does not require learners to be online together at a reticular time. They learn at the time that suits their life commitments. Further, blended learning is highlighted as a type of learning that integrates at least two of these approaches: asynchronous online, synchronous online or in-person learning. Blended learning is defined as " the

bringing together of the face-to-face classroom with opportunities to interact online" (Motteram, 2016, p. 90). Simply put, it refers to "a blend of online and face-to-face instruction" (Cronje, 2020, p. 114). These three concepts shift away from the principles of the traditional 'brick-and-mortar' classes (Charles & Pecorari, 2016).

3.3. Development of E-Learning Technologies

Anderson and Dron (2011) claim that distance education develops with regard to the dominating technologies used in course delivery. They divide it into three generations: The first generation of distance employed postal correspondence; the second wave of technologies was marked by the advent of mass media like film production, television and radio; this has been succeeded by the rise of interactive technologies such as audio, visual, web and then immersive conferencing tools. They believe that teleconferencing excels as highly practical with its one-to-one and one-to-many communication options.

Distance education has evolved in response to the technologies emerging during a particular era. The coming is examples of such development. The first era was labeled as 'learning with technology'. Healey (2016)presents some of its instances and their characterizing features: Initially, computer-aided instruction (CAI) is an approach that focuses on the machine as an instructor and a behaviourist trend towards learners who reply through pressing keys; second, the system of PLATO (Programmed Logic for Automated Teaching Operations) is an educational platform model engaging learners in progressively challenging tasks, starting by drilling in language classes, and then a decision would be taken about their advancement to another stage or required additional review depending on their accomplishment of multiple-choice tests. Healey (2016) mentions other acronyms which emerged with the availability of different computer programs such as Computer-Enhanced Language Learning (CELL), Computer-Assisted Writing (CAW), Computer Applications in Second Language Acquisition

(CASLA), and Technology-Assisted or Technology-Enhanced Language Learning (TALL or TELL).

In addition,Healey (2016)describes the second wave of technologies started by the 'emergence of the Web'**.** The advent of the World Wide Web (www) has provided plenty of services on the internet and consisted of millions of interlinked websites accessed through web browsers including Google Chrome, Microsoft Internet Explorer and Mozilla Firefox. (Pegrum et al., 2014).

Besides, Healey (2016) shed the light on the 'emergence of the Web 2.0 or the social web'. Pegrum et al. (2014) define web 2.0 as a new generation of web-based tools which turn their users into active communicators and content generators rather than passive consumers of the digital content. Blogs, wikis and social networks are examples of this type.

As technological development continues, the subsequent era has been characterized by 'connectivity and mobility with the emergence of mobile devices. Healey (2016) outlines the novelties brought about by the mobile devices such as tablets and mobile phones: Constant connection to the Internet everywhere and anytime via wireless networks or phone networks; those devices performing multi-functions encompassing making phone calls, connecting to the Internet, sharing knowledge and adaptable aids for pedagogy; broadening the learning scope beyond the classroom walls through media capturing of real experiences, transforming them into content and then sharing in the educational context; fostering personalized learning; engaging learners in authentic learning experiences such as video recording real conversations to practise language skills.

The proliferation of apps of apps results from the huge ongoing technological advancement. In parallel with the spread of mobile devices, these frequent software programs are primarily structured around transmitting content, drilling and practising exercises and then they serve to foster creative productivity (Pegrum et al., 2014).

3.4. Flipped Classroom Model: Development and Recognition

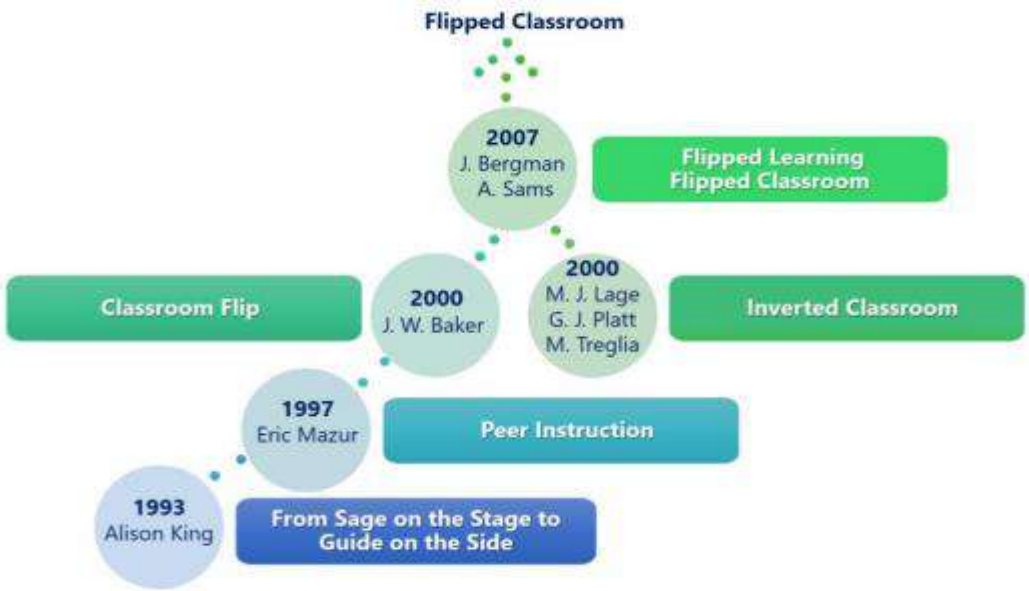
The Flipped Classroom (FC) Model has witnessed a gradual development through history. The official recognition of this model has come with Jonathan Bergmann and Aaron Sams in 2007. However, several studies preceded their work have referred to FCM core principles. A research depending on document analysis has been conducted by Ağirman and Ercoşkun (2022) to trace the historical development of FCM and identify the relevant concepts in the reviewed literature. The upcoming points summarize the work of Ağirman and Ercoşkun (2022) and highlight the main initial concepts matched to FCM and their advocates.

- Alison King (1993) highlighted the concept the necessity to shift from the teacher as a knowledge transmitter, or what is known as 'the Transmittal Model', to become a facilitator of the learning process. This idea was built on the constructivist principles of learning which encourage students to create knowledge. This concept is similar to learner-centeredness emphasized by FCM.
- Eric Mazur (1997) elaborated the strategy of 'Peer Instruction' which depends on collaborative learning among students to enhance leaning quality. This pedagogic practice has also become one of the foundational aspects of the FCM.
- J. Wesley Baker (2000) formalized the initial FC Model and coined the term 'Flipped Classroom'. His model is based on practicing pedagogy with technology intending to improve active learning and shift to learner centered approach with teacher's role as a guide.
- Maureen J. Lage and his colleagues (2000) initiated the implementation of FCM at the University of Miami. In their study, students were instructed to prepare for classes in advance using particular course materials. Following that, they were required to participate in class discussions and activities.
- Jonathan Bergmann and Aaron Sams (2007) officially recognized the advantages of using

the FC Model in contemporary education. They shared all their recorded videos online for students to view anytime outside of class. Class time was spent doing activities that reinforced the concepts of the videos. They believe that it assists all students to learn at their own pace. They also integrate the previously mentioned concepts of learner centeredness and collaborative learning, among others. Following their success, Bergmann and Sams published a number of books, addressing its application across various educational levels and fields of study. They are often referred to as the founders of this new technique. Since this teaching method proves efficiency, other instructors have started implementing it in their disciplines.

Figure 129

The Emergence Process of the FC Model



(*Note.* the figure is taken from Ağirman and Ercoşkun, 2022, p. 76)

3.5. Definition of Flipped Classroom

Recently, educators seek to come across innovative methods with the aim of maximizing learners' engagement and active participation. On that basis, the flipped classroom (FC), also known as inverted classroom, gains popularity and attention of educators (Holm et al., 2022). The concept of 'flipped' arises from moving traditional homework into

the classroom, and transferring the traditional classroom lecture to the learners' home (Gillette et al., 2018). According to its developers, FC is "basically the concept of a flipped class is this: that which is traditionally done in class is now done at home, and that which is traditionally done as homework is now completed in class" (Bergmann & Sams, 2012, p. 13). That is, FC is a pedagogical model where traditional lecture and homework components are reversed (Obari & Lambacher, 2015).

As stated by Li and Peng (2022), "the flipped class, classified as blended or mixed learning mode, puts part of classroom content outside of the classroom that can be online learning or video learning or both" (p. 1). FCM implies the employment of a mix of face-to-face and online procedures. Flipped education is, then, a type of blended learning that combines these approaches. According to Shibley (2014), the aim of blended learning is to boost greater student learning and improve the learner-centered paradigm. That is, it works in this way: Lectures are moved online to be viewed before class time, and classroom time is dedicated to engage learners into discussions and doing learning activities, while the instructor works on answering questions, providing support, giving feedback, and remediating the challenging issues through offering opportunities for reviewing them.

To understand what FC is, it is helpful to shed the light on what it is not. For, Ozdamli and Asiksoy (2016), Flipped Classroom is "not students spending all course period in front of a computer. It is not a student studying alone" (p. 100). That is, it not just about watching online videos and the videos do not replace the instructor. Rather, its essence is involving learners in achieving activities and engaging in discussions during in-person sessions about the videos they watched before coming to class.

The usage of the term 'flipped' is generally associated with students engaging with online materials followed by in-class practices that involve individual, peer or group work. There are many activities that can be part of a flipped class such as discussions, debates,

questions-answers, demonstrations, simulations and role playing. Course content can be available online using a variety of delivery methods: recording a voice over a PowerPoint presentation, recording whole lectures and publish them online, or sharing lecture notes for those who were absent from class, and conducting an online discussion (Schultz et al., 2014). However, it is worth mentioning that it is different from online education because activities done outside flipped classrooms are not necessarily performed online. In addition, using educational videos does not automatically result in a classroom being flipped. They can also include traditional methods such as writing and note-taking in addition to technological tools.

Bergmann and Sams (2012) explain the physical class stages of their innovative concept of FC in the upcoming points. Firstly, teachers open the face-to-face session with a very brief discussion with the learners about the videos they watch prior coming to class. It permits instructors to spend greater amounts of time tutoring students instead of lecturing them. The FCM modifies the role of the teacher from being a provider of knowledge to a guide, facilitator and organizer. Secondly, students are involved in performing learning activities stimulating their critical thinking and problem solving skills. In this stage, traditional assessment techniques are maintained to be utilized in FCM.

Interestingly, Bergmann and Sams (2012) affirm that this learning model falls short in meeting learners' needs to ask 'immediate' questions while watching the videos in the same way it occurs during physical classes. To address this shortcoming, these founders outline training at the beginning of the course to students for an effective application of the pre-class phase of FC. This training undergoes these steps: First, students have to turn off iPods, phones, etc in order to keep focused and avoid any sort of distractions while watching the target videos; second, they pause and rewind the video for better understanding; third, they take detailed notes employing the technique of Cornell note-taking (i.e. three sections to organize notes into: 'cue' to write keywords and questions, 'note-taking' to cover detailed

notes during videos, and summary of the video content); lastly, they formulate relevant questions to be asked during in-person class phase so that any misconceptions can be clarified. These authors consider students' questions as a source of reflecting on their teaching practices and evaluate the video effectiveness for further enhancements on its content.

Brown (2016) sheds the light on differences between 'Flipped Classroom' and 'Flipped Learning'. The former is defined as a specific teaching model which organizes delivering content and reverses in-class lectures and homework critical thinking activities. The latter is referred to as pedagogical approach which encompasses broader teaching strategies. It shifts direct instruction to individual spaces and turning group settings into dynamic environments where instructors guide student engagement and application of the acquired knowledge and skills.

3.6. Ways for Flipping Classrooms

Through putting FC into practice and its adoption by many educators, it is implemented in different ways. That is, its primary framework has been applied in several ways, depending on the requirements of the educational situations and levels. However, Biggs and Tang (2011) affirm that "there is no specific way to flip a class, and, in fact, the ability to flip a classroom in a variety of ways is one of the strengths of the pedagogy" (p.22).

Ozdamli and Asiksoy (2016) depict three of its models. The first one is the Traditional Flipped Classroom Approach of Sams and Bergman. According to this model, students are assigned homework in the format video presenting the content to be addressed in the next meeting in the physical class. They are supervised by their teachers only during the in-class phase. Additionally, their achievement of activities at home is neither recorded nor checked. In the classroom, the instructor answers the questions of students in a short warm up and then move to the practical activities (Brown, 2016).

The second is called Partial Flipped Classroom Approach. It is considered less strict in structure the first model. Students are instructed to view videos (digital content) outside of class time while ensuring they are not punished for not engaging with the content due to lack of equipment.

Holistic Flipped Classroom Model is another way for flipping classes. It emphasizes the concept of developing the learning culture. Concerning its structure, it intends to guarantee that the entire synchronous learning process, being it at home, mobile, and physical classrooms is supported and supervised (Chen et al., 2014). Ozdamli and Asiksoy (2016) portray the technique by stating that learners are required to login a predetermined learning platform, review lectures, study synchronously (e.g. doing a research on Cloud, taking quizzes, sharing reports on asynchronous classroom), engage in discussions and reflect on the course content. The selected platform has to allow recording all those learners' activities in its log.

More models for this pedagogy are defined and implemented in different contexts. This includes the 'In-class Flip'. As reported by Brown (2016), this model is similar to the traditional one, except for viewing digital content at home. Everything is done in the classroom. In-class Flip considers all the class steps including introductory lecture and learning activities as stations. It gives the teacher the opportunity to move between those stations depending on students' requirements to answer questions, provide support and explanations, but not redelivering the lesson content. It emphasizes project-based and critical thinking activities. Its key advantages is allowing teacher to address all lesson components within the limits of the session. Further, it decreases concerns for students without internet access outside class.

Another highlighted Flipped model is the 'Flipped-Mastery Program' or' Mastery Flip'. The latter is developed and adopted by Bergmann and Sams (2012) after abandoning

their traditional model. It differs from the traditional flipping in that students view the instructional material at the pace suiting them, but within the limits of predetermined due dates or deadlines. Additionally, learning is done inasynchronous system for an effective mastery of the content. That is, students are no longer engaged in synchronous collective way.

3.7. Drives for Transition to Flipped Classroom: Meeting Learners' Needs

Bergmann and Sams (2012), the developers of the flipped educational approach, present a number of arguments in favour of adopting of this model. First, FCM radically transformed the role of teachers by saving their time and effort lecturing. In the of our study, ESP teachers can use a pre-class video to present oil industry terms to students, then include those terms in face-to-face educational content for learners to use those terms in appropriate contexts while communicating and practising English.

Another motive they introduce is that FCM meets the needs of these days' digital native students who grew up in a world surrounded by digital devices, resources and tools. FCM intends to invest this point to get students learn in the ways suiting them using the technologies which they are familiar with as part of their life. At the same time, their preferences are addressed without necessitating any permission for using technological devices. To be applied on ESP, the teacher can allow for the use of dictionary software and artificial intelligence bots to translate the terms and refine students' ideas related to hydrocarbons field of study, meeting learners' needs and enhancing learning quality.

One further argument presented by the developers of the educational approach for flipping classes is its flexibility with students' business. Because the main content is provided through online videos, students are able to flexibly manage their non-academic responsibilities without missing any class content. To be incorporated in ESP case study, FC allows learners to review teachers' provided videos and extensively practice language relevant to their academic discipline in their free time.

The developers of the flipped educational approach also raise another point with regard to the assistance needed by struggling learners. FCM overcomes the traditional challenge of giving attention to the most active class students. Rather, FC class time provides support to passive learners facing difficulties, through individualized tailored explanations of key terms in field of petroleum engineering or some grammatical points relevant to students' discipline technical writing, for instance. Yet, this is done without discouraging the brighter ones.

Another point Bergmann and Sams (2012) make is that FCM suits all learning conditions. Students with disabilities can watch, pause and rewind the educational videos as many times as they need to learn the necessary content. Learners with physical disabilities are not required to spend too much time struggling to take notes. Similarly, students with cognitive impairments are able to spend as much time as they find necessary to understand the video content. In the research at hands, disabled students can take their time to review videos explaining particular oil drilling techniques, enabling their effective engagement in-class discussion about these techniques.

One more driving force for adopting FC is related to its potential of allowing self-paced learning. Bergmann and Sams (2012) believe that FCM saves teaches' time at covering the entire educational curriculum. In this model, students learn the foundational content before in-class time. This allows teachers to spend less time in delivering content. In addition, they focus on discussing key components of the lessons and providing more support for learners. In other words, FCM maximizes students-instructors interaction. With regard to our study, students can watch videos on seismic techniques in exploring oil reservoirs before class. This knowledge can directly be put into practice by making in-class oral presentations about a picture of the required machines and their roles in finding oil sites.

Bergmann and Sams (2012) further defend their innovative approach by arguing that it increases teacher-student as well as student-student- interactions. Concerning teacher-student is reflected in teachers' answering of questions, guiding teamwork, and providing individualized learning. This dialogue fosters their relationships. Putting it differently, instructors are representing a positive adult model to the students. With regard to student-student interaction, those facing similar problems are generally organized into one group, increasing the opportunities of their interactions and assisting each other without dependence on their instructor.

Further, Bergmann and Sams (2012) believe that flipping classrooms allow for true differentiation. As this teaching approach develops individualized learning, teachers can interact with each student individually. As for the excellent learners, teachers encourage them to demonstrate their understanding bydiscussing the points they grasp. Concerning the learners facing problems, teachers modify their assignments by just focusing the main objectives of the work, rather than discouraging them with more advanced content.

Another argument of the FC developers emphasizes its ability at facilitating classroom management. Traditionally, students with low attention regularly cause distractions for the learning process. They are generally bored or disobedient in nature. By flipping classes, the majority of learners are busy doing hands-on activities or engage in teamwork. Therefore, disruptive students either lose their regular audience or they are no longer bored and get involved into the learning process.

Moreover, FCM helps educational institutions at involving learners' families in their children's studies. These institutions get informed about students' learning backgrounds and personal issues. Parents can also have access to the content of their young children's lessons via watching teachers' videos, discuss it and build student-parent discussion. Additionally, a more transparent-rather than distrustful- class is developed by free access to the educational

content by all members of the community. These procedures aim at developing the necessary intervention for an effective learning by answering these two questions “Is each student learning? If not, what can we do to help them learn?” (Bergmann & Sams, 2012, p. 30).

As far as the usefulness of flipping classes is concerned, Bergmann and Sams (2012) depict FC as a substitute for absent teachers by prerecording videos about the intended lesson content. This ensures keeping the same pace and method of teaching. The last argument is that FC is developed to become a flipped-mastery program. That is, with the advent of FC learners watch the same video together at the same time. Then, this system is changed to allow autonomous asynchronous learning through accessing video content at the pace and time suiting them.

In a nutshell, Bergmann and Sams develop the concept of Flipped Classroom and present its underlying concepts with the aim of addressing the needs of today’s learners. The latter encompass: developing autonomous and flexible learning, supporting learners’ attention and understanding, reducing lecturing time in favour of discussion and practice time, and opening access to learning content to all community members. In short, FC intends to focus on enhancing learning itself rather than extensive classroom work.

3.8. Pillars of the Flipped Classroom: Revising F-L-I-P to F-L-I-P-P-E-D

Bergmann and Sams (2012) shed the light on what they call theFour Pillars of the Flipped Classroom: Flexible environment, learning culture, intentional content and professional educator. These pillars are represented by the acronymF-L-I-P.

3.8.1. F-L-I-P

Flexible Environment

Flexibility in learning refers to flexible FC learning time and space (Villegas, 2022). That is, FC enables making adjustments to the arrangement of the learning spaces to support independent or group work study. In addition, it entails adapting instructors’ expectations

concerning the time needed by learners to grasp the instructional content and complete assignments. This results in the adjustment of the assessments accordingly. That is, FC allows for a more personalized learning environment. In the words of Roehling (2018), it can be summarized as follows: “the physical classroom space must accommodate different types of classroom experiences and assignments Student assessment must also be flexible to reflect the more active types of learning that occur during the flipped class period” (p. 4). Chen et al. (2014) contend that flipped learning environments must be flexible, offering various learning modes and enabling learners to the time and setting of learning, while instructors adapt their teaching strategies accordingly.

Learning Culture

Chen et al. (2014) explain that learning culture entails a transition from teacher-centered to student-centered learning, using in-class time for deeper understanding of the content and increasing learning opportunities.

Intentional Content

In the perspective of Chen et al. (2014), teachers are required to carefully select and determine which learning content to be taught directly and which to be introduced as assignments for self-learning.The outside class content and in-class activities have to be “designed to facilitate higher-order thinking and promote course goals” (Roehling, 2018, p. 4).

Professional Educators

Roehling (2018) affirms that “good teachers are critical for the success of the pedagogy [FC]” (p. 4) despite the learner centeredness of this approach. Chen et al. (2014) claim that what FC emphasizes is not replacing teachers, but rather it insists on their professionalism for the effectiveness of this pedagogy. They consider the aspect of professionalism as more significant in FC than in the traditional teaching model.

3.8.2. Expansion of the Acronym F-L-I-P to F-L-I-P-P-E-D

Chen et al. (2014) review the literature related to the implementation of FC. They find that it- by the time of their research- was underutilized in higher education context.. They argue such expansion by outlining a set of reasons.

First, they criticise FLIP for putting more emphasis on content planning than on activity delivery. Rather, they believe in shifting flipped learning's focus from 'lecture-today' to 'activity-today'. Accordingly, FC has to focus on in-class activities and their delivery strategies. Second, Chen et al. (2014) create F-L-I-P-P-E-D to include opportunities for students' provision of feedback and reflection on their own learning experiences and perspectives, rather than considering solely the educator's view or input. That is, this model incorporates both perspectives. Third, F-L-I-P ignores encompassing details about formal and informal individual learning spaces as well as overlooking learning platforms' potential in enhancing learning. Conversely, the emphasis of modern technological and educational trends is on individualized, differentiated, personalized, and seamless learning.

Interestingly, Chen et al. (2014) further expand the schema suggested by Bergmann and Sams. They add 'P-E-D' to the original acronym to refer to their revising of the four pillars of the flipped classroom 'F-L-I-P'. Thus, F-L-I-P-P-E-D stands for the new components of the FC model: Progressive activities, Engaging experiences, and Diversified platforms.

Progressive Networking Activities

Based on the perspectives of Chen et al. (2014), the first added component of F-L-I-P-P-E-D model is 'Progressive Networking Activities'. It emphasizes the necessity of fostering dynamic activity delivery when flipping classes. Additionally, it highlights the shift from traditional lectures to interactive, network-based learning in higher education. This is due to the fact that "learning activities in today's higher education classes are no longer bound inside

a physical classroom: students learn using any device, at any location, and through multitudes of competing platforms" (Chen et al., 2014, p. 19).

Moreover, the concept of 'Progressive Networking Activities' addresses the challenge of student resistance to changing activity delivery. Such resistance results from students' familiarity to traditional lectures entailing their passivity, compared to the unfamiliarity and risk-taking learner-centeredness features of the modern teaching trends. Though their new component, Chen et al. (2014) suggest two strategies to address this resistance entailing teachers' gradual adaptation of their teaching strategies. First, educators need to opt for low-risk strategies during the early stage of FC adaptation (e.g. short group discussions), and then gradually employ high-risk techniques as students become more familiar to the active learning feature of FC approach. Second, instructors have to evaluate their own familiarity to the new instructional activities they use and evaluate those activities level of risk before implementation.

Engaging and Effective Learning Experiences

The second component of the FLIPPED model suggested by Chen et al. (2014) is 'Engaging and Effective Learning Experience'. The latter criticizes F-L-I-P model in that teacher's professionalism is not enough to ensure the effectiveness of the implementation of FC. Rather, importance has to be put on student learning experiences in a learner-centered culture. To that end, Chen et al. (2014) shed the light on the concept of 'transactional distance' as "the communication and psychological distance (not geographical distance) between instructors and students" (p. 19). This can be a consequence of lack of communication with students concerning the videos they watch at home prior class time. The greater this distance is in flipped classrooms, the more likely the learning experience is ineffective.

Chen et al., (2014) highlight the strategy proposed by Moore and Kearsley (1996) to solve this issue. It entails maximizing teacher-students communication opportunities, while balancing them with a non-predetermined structure, dialogue, and learner autonomy to enhance the learning experience. An instance to consider is that the teacher assigns small group discussions related to video content opting for strong instructional skills and strategies to foster effective dialogue and reducing transactional distance. On the part of the learners are required to compromise some autonomy to consider others' views and collaborate effectively.

Diversified and Seamless Learning Platforms

Chen et al. (2014) present the third component of the F-L-I-P-P-E-D model which is 'Diversified and Seamless Learning Platforms'. They recognize the significance of digital platforms (e.g. Collaborative Cyber Community) in empowering students to learn anywhere at any time. So, such platforms need to be developed to support personalized learning models like flipped classrooms. They are also required to provide diverse, seamless learning experiences that address individual needs. Therefore, a digital learning platform has to evolve from a Community Management System (delivering and tracking courses), to a Learning Management System (organizing and sharing knowledge within a community), then to a Knowledge Management System (organizing and sharing knowledge), and ultimately to an Innovation Management System (developing and managing new ideas). These online learning platforms are essential at supporting modern education through meeting its demands of individualization, differentiation, and personalization and enabling learning flexibility anywhere and anytime, saving in-class time.

3.9. Comparison of Traditional Classes and Flipped Classroom Model

The shift from the traditional classroom learning approach to modern technology-based teaching methods has evolved with the advent of the 21st century (Durrani et al., 2022).Flipped classroom differs from traditional classes in several ways. Access to internet

via digital devices allows students for greater opportunities to collaborate in order to access information and data. It also equips them with multiple tools to create and share a huge bulk of knowledge. In the context of FC, Bergmann and Sams (2012) state that “the class is centered around the students and not the teacher” (p. 16). For them, students bear the responsibility of watching the videosbefore entering the class, taking notes, asking questions, completing assignments and sharing content.

In the perspective of the developers of FC, Bergmann and Sams (2012) affirm that “the role of the teacher in the classroom has dramatically changed” (p. 14). In flipped classes, educators serve as expert feedback providers and class guides. Additionally, they depict FC teachers as doing tutoring functions while providing assistance to struggling learners. Yet, they portray them as never intended to be content presenters, i.e. not assuming the traditionally centeredness. This new role requires teachers to answer questions, guide their ideas, work with groups, and facilitating individualized learning during the majority of the class time, resulting in deeper understanding and fostering critical thinking (Bergmann & Sams, 2012). Simply put, a FC teacher becomes learning coach instead of all-knowing solely source of knowledge in the class. However, Healey (2016) contends that “teacher’s role in guiding students remains an important one” (p. 19).

Another difference appears from the types of learning activities in each approach. Charles and Pecorari (2016) define teaching and learning activities as “include the things that teachers and students do in pursuit of the learning objectives” (p. 68). They depict online activities as including real-time discussions on platforms (e.g. Adobe Connect) or asynchronous interactions on learning platforms (e.g. Moodle). Shirky (2011) views reading as "an unnatural act; we are no more evolved to read books than we are to use computers" (as cited in Pegrum et al., 2014, p. 3). In flipped classes, Bergmann and Sams (2012) affirm that students are engaged with assignments related to in-class lab experiments, researches, tests, or

guided problem solving tasks after answering questions about a video watched in the prior to class phase. Conversely, traditional language classes involve learners in discussions or activities to practice the content after teacher's presentations of chunks of declarative knowledge (Charles & Pecorari, 2016).

One further difference is that the educational environment has witnessed tremendous changes. Students' attendance in conventional classes is an obligation. Unlike the traditional educational institutions, the use of online tools and the unrestricted access to knowledge at any time decrease the necessity of presence in the physical learning environments (Motteram, 2016).

Another difference between the traditional and flipped teaching approaches is related to the notion of 'literacy'. FCM expands the concept of literacy. Drawing on the insights of other scholars, Pegrum et al. (2014) state that the concept of literacy has changed by the digital tools and resources from being " a monolithic, print-based skillset" (p. 3) and tied to individual's skills to become plural in nature and linked to social practices.

Restructuring traditional class time is another feature of FCM. Bergmann and Sams (2012) explain the new modifications as follows. Traditional classes generally start with a long warm up when learners have homework. So, they take longer time (25 minutes) to get answers to the points they are confused about. This step is followed by a presentation of the new content for 30 to 45 minutes. The rest of the class is spent at performing hands-on activities. Conversely, the time devoted clear up students' misconceptions about the video content in FCM is diminished to a few minutes. Then, the majority of class time is dedicated to more extensive activities to put the acquired knowledge into practice.

According to Al Baekani et al. (2023), learner centeredness is the main differentiating characteristic of the flipped classroom learning model from the traditional approaches. In conventional classes, teachers do most of the task and are seen as the fundamental source of

knowledge. Students are actively and independently engaging in the learning process outside classroom in FCM. Instead of learners' passivity, the modern teaching model is based on fostering active participation and self-regulated learning in order to enhance student engagement and improving educational outcomes. Students' class contribution is different as they become the primary responsible for their own learning through problem solving and peer teaching (Baepler et al., 2014).

3.10. Theoretical Background of the Flipped Classroom

Effective teaching requires setting the stage properly to students and get them ready to realize that their motivation is a good and impelling idea and establishing a positive atmosphere for constructive interactions with the learners (Biggs & Tang, 2011). Deciding about the right teaching method means deeply understanding its theoretical background.

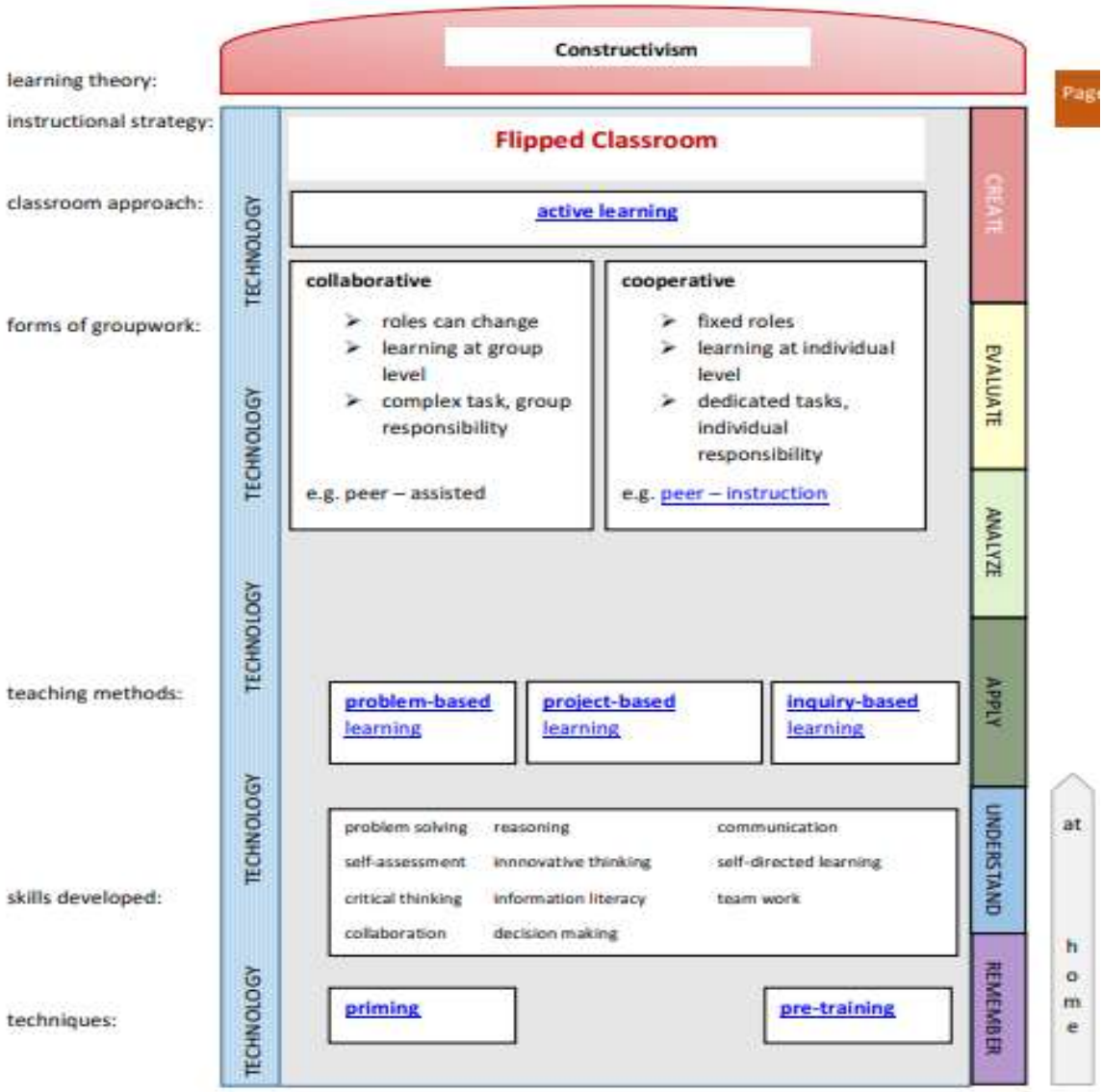
In the perspective of Cronin and Coakley (2018), student-centered modern approaches, including FCM, rely on involving learners in concrete experiences that can support students to actively construct their individual meaning. This constructivist key principle replaces the traditionally behaviourist teacher-centered practices. Accordingly, the Behaviourist Theory undervalues the importance of connecting new knowledge to prior information on getting deeper understanding, retention and practice. In addition, it puts little emphasis on group-based learning.

According to Anderson and Dron (2011), the constructivist model implemented in the current educational practices can be traced back to the theories of Vygotsky and Dewey under the umbrella of social constructivism. They add that the emergence of social constructivist pedagogical models has occurred in parallel with the two-way communication technologies development, initially by email and bulletin boards then later by proliferation of mobile technologies and the World Wide Web. That is, moving from primarily conveying information to providing opportunities for supporting synchronous and asynchronous

instructor-learners interactions, and, then, recognizing the collaborative key principle of knowledge and its construction of individual learners' minds building upon their prior learning through engaging them in projects, team works, discussions, etc.

Figure 20

The Flipped Classroom within Constructivist Learning Framework



(*Note.* Adapted from Cronin & Coakley, 2018). Innovating Vocational Education: Flipped Classroom in Practice. p. 12)

By understanding the constructivist nature of FCM, it seems that it forms the foundation for teaching ESP, the focus of the current research. In this vein, Vavilina, 2020

affirms that "constructivist theory, that suggests that knowledge is constructed in professional contexts through the social interaction, underpins the whole range of methods for teaching ESP in the digital age" (p. 169).

Likewise, Villegas (2022) argues that flipped classroom is social-constructivist in nature when implemented in the context of English for Academic Purposes (EAP). This researcher seeks the principles of this learning theory in the four pillars of the flipped classroom set by Bergmann and Sams (Flexible environment, learning culture, intentional content, professional educator). The findings of Villegas' study reveal those key principles of FC are supported by the social constructivism and comply with the core concepts of EAP. Villegas (2022) proves that successful learning results from students' interaction and collaboration with their peers and tutors, in addition to engaging with tasks within their ZPD [Zone of Proximal Development] (Vygotsky, 1978)" (p. 24).

Table 10

Corresponding the Characteristics of Social Constructivism to Flipped Classroom Pillars

Characteristics of constructivist learning and teaching according to Chen (2010, p.15)	Corresponding FL Pillar
Authentic tasks and context	Pillar 1- Flexible Environment, Pillar 3- Intentional Content
Learners' ownership of learning	Pillar 2- Learning Culture, Pillar 4- Professional Educator.
Personal constructed reality	Pillar 1- Flexible Environment, Pillar 2- Learning Culture.
Opportunities for collaboration	Pillar 2- Learning Culture, Pillar 4- Professional Educator.
Opportunities for reflection	Pillar 2- Learning Culture, Pillar 4- Professional Educator. Interestingly, opportunities for reflection under FL Pillars involve both learners and teachers.

*(Note.*Adapted from Villegas, 2022, p. 19)

Drawing from the insights of what precedes, FC is seen as constructivist in nature due to its focus on active learning and independently engagement in instructional activities

through collaboration, discussions and understanding and applying the acquired knowledge. Unlike these constructivist principles, Behaviourism focuses on observable behaviours and reinforcement whereas the flipped classroom stresses social interaction and collaborative learning.

3.11. The Role of Bloom's Taxonomy in Enhancing the Flipped Classroom

The main objective for adopting FCM is developing a culture of learning among learners and train them "to identify learning as their goal, instead of striving for the completion of assignments" (Bergmann & Sams, 2012, p. 27). Morton & Colbert-Getz (2016) affirm that "the FC is designed to have students apply, analyze, and evaluate material" (p. 2). That is, depending on the recall of material would most likely not result in enhancing student performance in the FC. Bloom's Taxonomy, developed in 1950s, outlined six cognitive categories ranging from recall to evaluation. In 2001, it has been revised to include remembering, understanding, applying, analyzing, and evaluating. The revised version also emphasizes that content should align with the expected cognitive levels of course goals (Morton & Colbert-Getz, 2016).

Interestingly, Guo (2022) believes that "the application of Bloom's revised taxonomy of cognitive domains to the flipped classroom has significant implications for student learning" (p. 1181). Vavilina (2020) investigates how to use the Taxonomy of Educational Objectives to effectively reinforce effective learning in a technology-enhanced learning environment. Accordingly, Bloom's Taxonomy assists instructors in the delivery of content in ways that consistently engage students' cognitive skills across all levels of the taxonomy during the three phases of the flipped classroom: pre-, in- and post-class sessions. Along these lines, Cavage (n.d.) contends that in a conventional classroom, new content is delivered entailing learners' understanding and recalling of knowledge on one hand and their application of that knowledge and creating their own outside of class through achieving

homeworks. However, in a flipped classroom, the lower levels of Bloom's Taxonomy (Remembering and Understanding) are applied outside class time, allowing for higher-order skills (Applying, Analyzing, and Creating) to take place during class time.

With regard to the FC phases' content, Cavage (n.d.) states that not any content should be moved outside class time. Shedding the light on ESP classes as an instance, content that entails repetition (e.g. new structures and concepts) need to be addressed outside of the classroom. This would enable students to be exposed to the material and autonomously engage with it multiple times through digital tools (e.g. Khan Academy, TeacherTube, TedEd, and YouTube). In the meanwhile, class time is devoted to apply, analyze, and create content related to what is learned outside of class. Put differently, the process of moving new content outside is intentional and selective to improve students' quality of learning and autonomy.

Regarding the benefits of Bloom's Taxonomy in designing clear learning objectives, Vavilina (2020) justifies the selection of this framework by arguing that the act of teaching according to Bloom's Taxonomy entails two fundamental goals: intentional and reasoned considerations. First, the reasoned aspect refers to the selection of objectives in the light of needs analysis and the learning context; second, intentional aspect implies shaping learning environments, designing relevant tasks, and offering appropriate learning experiences to support students achieve these objectives. Thus, when integrating digital literacies into ESP learning, it is essential to align technological affordances with the intended learning goals.

3.12. Materials for Flipped ESP Classes

3.12.1. Overview of Teaching Materials in Flipped ESP Classes

Motteram (2016) believes that "it is likely that a lot of teachers are going to be looking at ways of enhancing or supplementing their regular classes with technology" (p. 90). Correspondingly, Kessler (2016) states that a deeper understanding of the educational practices linked to technological advancements leads to a need for a new framework

leveraging modern technology in the classroom. The current research presents flipped learning as involving the use of technology for out-of-class learning. FC has been founded with an emphasis of employing teaching materials that would help at enhancing students' engagement and active learning. Selecting the best educational materials ensures the validity and practicality of effective English teaching resources (Febriati & Jaya, 2022).

The developers of FC Bergmann and Sams (2012) affirm that "not all flipped classrooms use videos as an instructional tool" (p. 96). In contrast, they emphasize that the flexibility of this pedagogy allows instructors to select materials that best suit their learning process. Additionally, FC empowers learners to create their own instructional materials and showcasing their understanding of the content through leveraging their digital skills. Students are able to "blog, create videos, create podcasts, and create many different educational products" (Bergmann & Sams, 2012, p. 50).

3.12.2. Criteria for Selecting Tech Educational Materials for FC

Charles and Pecorari (2016) contend that decisions to incorporate modern technologies should consider their pedagogical advantages in specific teaching contexts. In the context of English for Specific Purposes (ESP), language materials are developed in a world where digital technologies (e.g. tablets) are replacing their counterparts (computers) and mobile devices such as the laptop and mobile phones (Motteram, 2016). Nowadays, they are widely at the reach of people around the world and can be used in classrooms. For effective use of those materials, several criteria have been introduced based on their benefits, notably authenticity, availability, credibility, alignment to the learning objectives and learners' needs, relevance to course objectives, etc.

In the perspective ofWoodrow (2018), online sources are usually not reviewed or verified unlike the published materials and content generators can be without any expertise for developing them. Therefore, ESP course designers need a system to evaluate the authenticity

of online materials. Three main criteria are highlighted: First, reliability of the sources and accuracy of information; second, the intended audience of the content; lastly, materials up-to-datedness. These elements are referred to by Chan (2009) as 'authenticity, suitability and credibility' (as cited in. Woodrow, 2018).

Motteram (2016)shed the light on a number of criteria linked to the specificity of context before adopting a particular material. Instances for this case encompass: the varied types of classrooms, the purpose of integrating technology within the learning environment, the availability of resources and infrastructure such as electricity and digital tools, the English language proficiency of educators.

Considering other materials efficiency criteria, Cowie and Sakui (2013) claim that the selection of particular tools by educators is determined by their course objectives. In their study about e-learning in four universities, they find that if the objective is to encourage leaner collaboration on achieving projects within or out of class time frame, teachers commonly depend on

> Facebook and Twitter (social media sites that were used for students to communicate with each other and their teacher, and used for uploading and downloading various projects); Google Docs (a collaborative writing tool); TodaysMeet (a backchannel or comment posting site); tricider (a brainstorming and voting site); myBrainshark (a presentation sharing site); and Diigo (a social bookmarking site). (Cowie & Sakui, 2013, p. 462)

Motteram (2016) sheds the light on the importance of needs analysis in designing materials for ESP contexts. In this perspective, Healey (2016) contends that "teachers could set up websites, discussion groups, and mailing lists, and provide updated digital material in response to learner needs" (p. 17). In the context of ESP, Woodrow (2018) adds another technique to evaluate online resources for ESP relying on language corpora. These large

collections of texts can be analysed by concordancing software (e.g. Wordsmith) in search for common field-specific words and phrases.

3.13. Types of Materials for Flipped ESP Classes

For Kessler (2016), the goal of using technology should be employed to assist language learners in using the target language appropriately in authentic communicative tasks, rather than being an end in itself. Dudeney and Hockly (2016) depict the unparalleled access and availability of technology as being ranging "from gaming machines to mobile phones, fast Internet access at home, on the move and, increasingly, at school as new initiatives bring interactive whiteboards (IWBs), electronic content, netbooks and other technological tools into learning" (p. 115). There is no consensus on digital tools and resources that educators should opt for, leading to different teacher preparation programs for language communication (Kessler, 2016).

The Internet

The emergence of the Internet has fundamentally transformed the methods in which information is accessed and distributed all over the world at any time and any place in general and the creation of new learning methods such as distance. Motteram (2016) states that "in more recent years, I have turned to the internet as a source of study material" (p. 89). Healey (2016) states that the internet has played a significant role in transforming language learning over time. This researcher adds that the advent of the internet has marked a revolutionary transformation in the incorporation of technology within the realm of education and had key roles such as: facilitating authentic communication among language instructors and learners through sharing their work, chatting and exchanging emails; availability of prevalent access to information beyond geographical borders; creating opportunities for collaboration to achieve tasks in groups through meeting virtually; ensuring anonymity by chat sites allows for

authentic expression; netiquette equips learners with an awareness of prioritizing personal well-being over engaging in negative interactions or responding to inappropriate comments.

Internet has greatly simplified the task of designing courses through providing a wide array of free authentic materials, written and spoken texts meeting differentiated learners' needs, by designing activities based those available materials and enabling learners to access courses specific to their fields (Woodrow, 2018). According to Healey (2016), the use of internet learners signifies unprecedented level of learner autonomy as they access native speakers and authentic material independently while it creates challenges to teachers' dominance over information. Healey (2016) also sheds the light on unrestricted resource availability at no expense resulted from the proliferation of the internet.

Learning Management Systems (LMSs)

Cowie and Sakui (2013) define Learning management systems (LMSs) as software programs assisting educators to manage and deliver a vast array of courses in varied methods. They introduce three cases illustrating this point: Blackboard is a commercial program commonly installed for the entire university; Moodle is a cost-free or open source program that can be adopted by the entire university, but is usually utilized by individual educators; Edmodo is social media software attracting more individual teachers. In the perspective of these researchers, these tools can be used by instructors in coordinating coursework, tracing any advancement, publishing instructions and forming groups. They also enumerate some of their benefits for learners such as having access to learning materials, receiving guidelines, uploading or downloading digital content and engaging in communication with their fellow learners.

Social Media Sites

Kessler (2016) claims that "recently there has been an increase in attention to the potential of social media and the many collaborative web-based tools for language teaching"

(p. 63). This researcher believes that this is due to the familiarity of both learners and instructors to the use of these tools for their personal endeavors. In addition, they provide exceptional opportunities for learners to communicate interact and cooperate using the target language. Healey (2016) affirms that social media enables individuals to share information with other people easily and constantly. Moreover, social media offers language teachers and learners with a communication-rich context featured by meaningful interaction and motivated learning.

Mobile Apps

Mobile apps, allowing users to connect with their friends, create communities of practice for language learning (Healey, 2016). Games are a highlighted instance in this context for their advantages. Games apps have for a long time been used in language teaching such as "London Adventure, Lemonade Stand, A la Rencontre de Philippe, Who is Oscar Lake?, Trace Effects, World of Warcraft and Farm Ville" (Healey, 2016, p. 19). They create an environment of real communication via texts or voice, and encourage cooperative work in multiplayers games when teachers consider a bit challenging level.

Digital Platforms

Vavilina (2020) lists a set of digital platforms and software tools to facilitate ESP learning. This includes "open-access university programmes, Massive Open Online Courses (MOOCs), 3D virtual environments, cloud sites, e-learning platforms, podcast and video-creation software, concordancers, presentation software and story-telling tools, computer-based testing tools, survey applications, video conferencing software, website content builders and others" (p. 170). Charles and Pecorari (2016) define learning platforms as electronic repositories for materials which serve as channels to distribute knowledge and handouts similar to those shared in the classroom.

Email

Woodrow (2018) argues that email is the most prevalent form of daily communication

in academic settings between educators, administrative personnel and learners. Accordingly, these individuals are provided with an exclusive email account, which serves as a medium for keeping everyone informed and up to date about university-related issues beyond regular studying hours. This account can be accessed on a variety of electronic devices including computers, tablets, mobiles, and iPads. This develops collaborative and interactive teaching-learning atmosphere. Unlike the delay of the traditional pen pal projects imposing restrictions on the frequency of interactions, keypal projects using email for communication shift emphasis from the duration transmission of the task to the time investment for the achievement of tasks assigned by the educator (Healey, 2016).

Blogging and Microblogging

Blogging is introduced by Woodrow (2018) as one of the tools affecting communication in ESP. She defines it as an interactive internet-based communication. Accordingly, it has developed from individual monologues to multi-authored and dialogic posts. A matter which helps at creating learning communities where academicians maintain researches related to their respective disciplines. As stated by Woodrow (2018), microblogging indicates social media platforms (e.g. Facebook) to communicate short instant content. These tools provide rich resources for course designers to track the current issues. According to Bloch (2013), social media platforms make group collaboration (e.g. preparing presentations) easier and peer feedback (e.g. writing real-time comments on peers' performance while presenting their work) more immediate (as cited in. Charles & Pecorari, 2016). Pegrum et al. (2014) claim that some teachers consider facebook as a hub for students' meetings as well as virtual learning environments in which information are shared, cooperation is fostered, and announcements and assignments are made.

Artificial Intelligence

As the most recent technology, AI is characterized by its capability to perform tasks that typically require human intelligence (Adamopoulou & Moussiades, 2020). AI traces and records users' behaviour through interactions and immediately adapts it to offer personalized learning experiences. Li and Peng (2022) conduct a study to evaluate the effectiveness of a flipped classroom model integrated with an AI Language Learning Platform. These researchers intend to assess its impact on students' performance and attitudes towards learning English, particularly in listening skills. The findings indicate that AI-based language learning platform mainly performs controlling and tutoring tasks. Additionally, it enhances learners' interest, autonomy, and engagement.

One of the AI tools that has been tested in language classes is chatbots. The latter's use has rapidly increased in recent years in many fields of study including education. Adamopoulou and Moussiades (2020) outline a set of their features. Chatbots interact with users through text or voice, understands human languages to conduct multiple conversations simultaneously. Additionally, they do not require any installation and easily accessible. Fryer and Carpenter (2006) state that AI bots have the potential of facilitating language practice for students at anytime and anywhere, addressing their learning needs. Further, they create comfortable learning environments for students who "generally felt more comfortable conversing with the bots than a student partner or teacher" (Fryer & Carpenter, 2006, p. 8).

Hardware

According to Pegrum et al. (2014), "in addition to an internet connection, teachers and students need adequate hardware" (p. 4). They mention fixed computers in labs, laptops and mobile handheld devices such as tablets (e.g. the iPad) and mobile phones (e.g. the iPhone, Android phones and BlackBerry phones). They also indicate the data projector through which, say, the highly developed touch-sensitive interactive whiteboards can be functioned to display, interact with webpages or software, or to capture and store notes. Additionally, they

highlight clickers (or personal response systems displaying learners' responses to questions on a screens or smartboards) and 3D printers.

In the same vein, Healey (2016) believes that the widespread use of mobile devices along with the emergence of social web have caused a crucial transformation in how people communicate with one another. Consequently, this influences language learning approaches by creating new opportunities for language learners to connect, interact, and learn with the languages in creative and unprecedented methods.

3.14. Implementation Stages of the Flipped Classroom in Higher Education

As far as the FC blending of in-person and online teaching methods is concerned, Bergmann and Sams (2012) affirm that "some concepts must be discovered independently by a student, others are best taught directly, and others under a Socratic dialogue" (p. 109). Although there is no current consensus on the structure of a flipped classroom, a general framework has been introduced. Its adoption is due to promoting active methodologies of student centered education. In the current research, it further comes in response to online learning adoption during and in the aftermath of Covid-19 Pandemic in the Algerian higher education. Throughout addressing the stages of implementing FC, it is important to present the guidelines that would guarantee an optimum flipped learning experience (Roehling, 2018).

3.14.1. Preparation or Planning Phase

Planning has to precede the development of the teaching-learning process using the FC framework (Mandasari & Wahyudin, 2021). Teachers have to take into account are: designing the course for the academic field of study based on this pedagogy; being trained on the use of the technological materials and any digital content they intended to incorporate in their classes such as the learning platforms and recorded videos or sessions; designing the learning sessions following the guidelines of this educational modality; lastly, determining the assessment techniques to be used. Upon their first meeting, it is important that the instructors

dedicate a session for explaining the strategies of the flipped classroom approach (Mandasari & Wahyudin, 2021). They shed the light on their and students expected roles and present the main objectives of the designed content, explain the ways of using the selected technological tools and resources, establish assessment criteria, and outline evaluation criteria.

3.14.2. Before the Class Phase

According to Chen Hsieh et al. (2017), "the before-class component of the flipped classroom provides students with initial exposure to the content in an asynchronous online format" (p. 55). Students can access this content with the help of the internet (Mandasari & Wahyudin, 2021). Teachers use existing content from other teachers as a starting point before gradually creating their own original one (Bergmann & Sams, 2012). Students are instructed to take notes about the significant points from the material presented and to identify any misconceptions and questions related to them during the face-to-face class time (Mandasari & Wahyudin, 2021). One of the most important factors to be taken into consideration by the teachers is the identification of the kinds of incentives or motivations which can foster students' engagement to guarantee an efficient preparation for the in-class activity (Cronin & Coakley, 2018). This phase provides learners with opportunities to learn at their own pace and actively engage with the material prior class time.

With regard to the likely addressed content, Chen Hsieh et al. (2017) contend that students may tackle "readings, lecture, and video materials as well as low-stakes assessments p. 55). Additionally, the educator selects content which aligns with the lesson objectives to introduce the topic to the students and lay the ground for the in-class context. As far as the targeted learning skills in this phase are concerned, students are required to remember the presented knowledge, understand the lesson ideas and analyze the content provided.

For an effective learning during this phase, Bergmann and Sams (2012) outline a set of requirements. First, students are trained to watch videos while turning off any distracting

devices by the beginning of the course. Second, they are encouraged to employ the pause and rewind features for better understanding and to have enough time for note-taking. Then, they reflect their misconceptions about the content into questions.

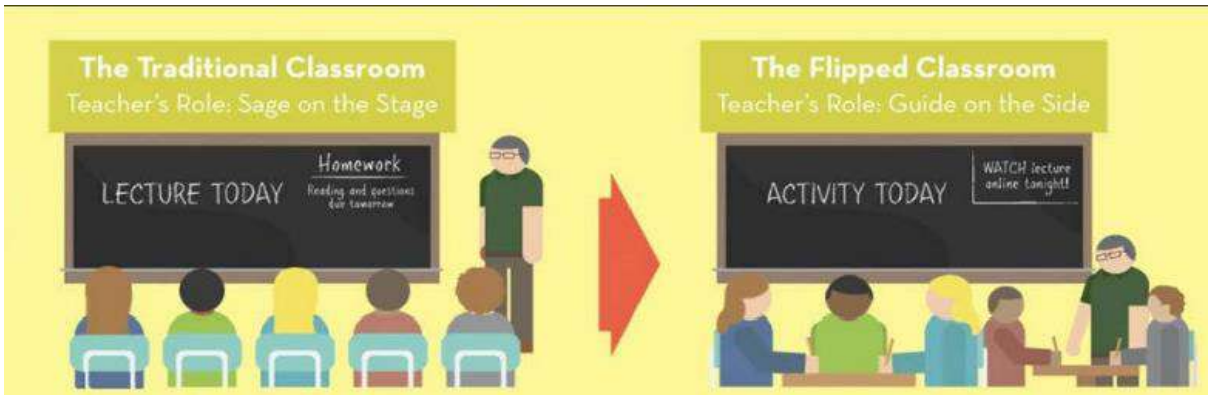
Before the flipping class phase, the acquisition of knowledge relies primarily on students' self-study and saves students' and teachers' valuable classroom time. When implementing Bloom's Taxonomy, Before Class Phase addresses lower order cognitive skills which require students to "Understand (summarize, explain, debate, demonstrate … Remember – define, list, memorize, repeat, recall" (Cronin & Coakley, 2018, p. 83).

3.14.3. During Class Phase: Face-to-Face Class

With regard to the advantage of face-to-face classes, Bergmann and Sams (2012) affirm that "although we know that the lecture is not the best means of communicating information to students, sometimes direct instruction has a place" (p. 109). By taking the main content of the

Figure 21

Traditional vs. Flipped Classroom Teaching Approaches



(*Note.* adapted from Cavage, n.d.)

lesson outside the classroom, teachers have extra time for clarifying misconceptions and support learners while applying that acquired knowledge in hands-on activities using skills of communication, problem solving, critical thinking and collaboration. Besides, pair and group work are adopted to encourage learners' participation and engagement. In English classes, for

instance, teachers can provide a video about grammar points and conversation starters prior coming to class so that the in-presence class becomes rich “in more conversation, reading literature, and writing stories, all in the target language” (Bergmann & Sams, 2012, p. 48).

The developers of FC depict the classroom space association with this teaching model. During class phase, the traditional classroom organization entails facing all desks to the board while the teacher is in the center of the classroom. Rather, all desks are turned towards a screen. This strategy intends to positively affect the psychology of learners by placing learning at the center of the classroom rather than the teacher.

Figure 132

Template of a Flipped Face-to-Face Lesson Plan

Scheduling a face-to-face session

- Teacher's name:
- Subject:
- Course:
- Lesson theme:
- Objective of the lesson:
- Duration of the session:
- Connection with other subjects:
- Evaluation methods:

Timeframe	Parts of the lesson	Teaching strategy			Notes, comments
		Methods	Working forms	Tools	

(*Note.* Adapted from Cronin & Coakley, 2018, p. 82).

The in-class phase starts with a very short warm up in which the teacher address students’ questions to clarify misconceptions about the pre-class content before moving to putting it into practice through hands-on activities (Mandasari & Wahyudin, 2021; Bergmann & Sams, 2012). This type of teaching modalities intends to minimize the time of lecturing to explain the new content to the class and dedicate it for more practice. Unlike the traditional teaching methods, the teacher's role shifts from knowledge presenter to tutor, guiding interaction and support struggling students.

Accordingly, those activities and instructions have to be aligned with students' higher-level cognitive. Delivering content outside the classroom assists at devoting in-class time for developing higher-order cognitive processes (e.g. analysis, evaluation, application, and creation) (Li & Peng, 2022). These skills require learners to "Create – construct, design, create, simulate, invent… Evaluate – criticize, judge, review, defend, validate, test, argue… Analyze – compare, examine, relate, categorize… Apply – use, demonstrate, implement, illustrate, operate" (Cronin & Coakley, 2018, p. 83).

In case learners skip viewing the pre-class content, though missing significant tutorial time, Bergmann and Sams (2012) suggest providing in-class computers and placing them at the end of the classroom. This strategy would allow those students to watch the videos or view the target learning content individually before joining the class practices and discussions.

3.14.4. Post-Class Phase

The use of this phase is not common in current FC practice, as additional work after class coupled with previous classes in the next class can produce boredom among students. Teachers assess their students' learning after class, but during class time). By the end of the face-to face session of the flipped lesson, educators ask follow-up comprehension questions and assign projects and presentations to be achieved by learners. This assessment step aims to evaluate the learning process for any further improvements.

Chen Hsieh et al., (2017) present this phase in an exceptionally comprehensive manner. Formative and summative types of assessment are used in the flipped classes. The summative assessment (e.g. exams, quizzes, and presentations) is beneficial as it provides final grades. However, formative assessment is more appropriate for the flipped classroom model. It allows the provision of feedback at any point during the learning process without being graded. Additionally, it enables teachers to adjust their teaching methods to meet the

needs of students, promote students' personalized inquiry learning, and let students get a real learning experience in self-inquiry (Shan, 2021).

Chen Hsieh et al., (2017) introduce a number of examples of this assessment technique. The latter include muddiest points (confusing concepts or topics highlighted by students for further clarification), burning questions (urgent learners' queries needing more explanation), clickers (devices for immediate student feedback), and spinner. The latter is divided by the teachers into, say, four areas where Bloom's taxonomy verbs (such as explain, summarize, predict, evaluate) are posed to an individual or groups of students to answer previously prepared questions based on the spin.

3.15. Assessment in the Flipped Classroom

In the perspective of Roehling (2018), For flipped learning to succeed, students must come to class prepared to meaningfully engage in the in-class learning activities" (p. 5). To that end, teachers need strategies to keep learners' accountabilityfor doing pre-class assignments. Among those strategies is maintaining a kind of assessment in order to ensure students' understanding during the pre-class phase and help instructors to determine the learning objectives are achieved. Assessing through the use of incentives (e.g. quizzes and guided reading questions) proves to be efficient in enhancing learners' engagement with the pre-class assignments while assessing pre-class homework. Furthermore, grading those assignments maximizes motivation and engagement of learners, and hence, taking the fullest advantage of this learning model of enhancing leaning. However, the use of random grading (randomly selecting only a number of students to be graded) or broad grading (e.g. good, adequate, and not complete) ensures students' seriousness with the tasks without feeling the grading overload and anxiety.

Other assessment methods are implemented in the flipped classroom. Depending on the participants involved in the learning process, assessment can be done in the following

ways: “Teacher evaluates individual student performance, teacher evaluates groupwork, student self-assessment, student assessment by peers” (Cronin & Coakley, 2018,p. 86). Self-assessment and peer assessment foster student autonomy, responsibility towards their studies and social skills.

Cronin and Coakley (2018) summarize the previously mentioned self-assessment techniques in the concept of ‘developing assessment’ as aiming to foster higher cognitive skills through enabling learners to “identify their own weaknesses, plan the necessary next steps and take responsibility for performing them” (p. 87). Such technique encourages students to find their own systems for learning and simultaneously enables instructors to make the necessary modifications and improvements on the instructional strategies and content. All in all, the ‘developing assessment’ promotes student-centered assessment for a better learning quality. It uses methods such as “self-assessment, peer assessment, project work evaluation, cooperative work, portfolio, articles, studies, study logs” self-assessment, peer assessment, project work evaluation, cooperative work, portfolio, articles, studies, study logs” (Cronin & Coakley, 2018, p. 87).

Interestingly, the developers of the FC approach emphasize the importance of the assessment strategies in this model. The advantages of assessment can be maximized through leveraging technology to offer valuable feedback for the learners as well as ensuring effective implementation of the model. Starting by formative assessment, Bergmann and Sams (2012) affirm that different assessing activities are provided for learners based on their differentiated cognitive abilities. Tasks range from structured assistance to fully challenging depending on the learning situation, avoiding learning through spoon-feeding the content to students.

A further point to be considered in formative assessment is that students are responsible for demonstrating the proof that they master the learning objectives. This can be done through asking the right questions about those objectives. Otherwise, teachers plan

customized remediation including: asking learners to view (if first time) or review the pre-class content, recommending consulting of particular textbooks or webpages, or providing individualized face-to-face support to clarify any misconceptions. By implementing these formative assessments, Bergmann and Sams (2012) believe that teachers become able to check student understanding and to foster content knowledge.

With regard to the summative assessment, Bergmann and Sams (2012) highlight the existence of different models which enable students to show a minimum standard of proficiency such as tests, exams and remediation. Yet, the distinguishing aspect of FCM is that it insists on submitting 'quality work' rather than just 'getting by'. That is, they engage with the content and the tasks with minimal effort.

As for the challenges facing assessment in the flipped classes, a number of learners resort to cheating when they take their exams. To avoid these unethical practices, Bergmann and Sams (2012) primarily scheduled the exams in different times, often in less supervised settings. Unfortunately, some students fell back on taking pictures of the tests using their cell phones and sharing them to those who had not taken that exam. Additionally, conducting the exams using computers also proved failure as learners found ways of sending copies of the whole exams to their home accounts and then forward them to other students. Further, taking the exams in the school libraries provided the learners with opportunities of group work or to cheat using notes.

Importantly, Bergmann and Sams (2012) suggest solutions to the previously mentioned obstacles facing the learning process assessment. The first measure is that teachers set up password-protected computers, and input the password for each exam. They type that password after ensuring students' logging on their accounts. The second proposed strategy is evaluating students' level of performance by giving grades A (excellent), B (above average), C (average), D (below average) and F (failing). One other technique for an efficient

assessment to take place is creating unique version of each exam for each learner. These researchers describe this strategy as laborious and explain its steps by stating that

> When we write our questions, we create multiple questions that assess each objective. Then, when we build our exam, we have the computer randomly choose one or more questions from each objective. Doing so creates tens of thousands of versions of each test, solving the logistical problem of multiple versions. (Bergmann & Sams, 2012, p. 91)

3.16. Transforming ESP Classes Using Flipped Classroom

Learning approaches must be transformed to align with the demands of the digital age (Cowie & Sakui, 2013). In the recent times, Flipped classroom has gained attention in English for ESP teaching practice (Pavlova & Valeeva, 2019; Liu et al., 2022). Hsiao et al., (2023) state that it has been extensively adopted in Science and Technology Education disciplines. It has brought changes to the teaching style as it entails students' active participation knowledge understanding and application (Pavlova & Valeeva, 2019). In our study, we apply FCM in the English for oil drilling classes as one of the science and technology fields of study.

Through the implementation of FC in ESP classes, Liu et al., (2022) affirm that learners can address the assigned target subject knowledge in the pre-class phase to save class time traditionally devoted for teachers' explanation of such content while using in-class time for the practice of language. In addition to ESP potential of centeredness learners' role by customizing materials and content to meet specific needs, FC places those learners at the center of the learning process by promoting their responsibility for their own learning.

According to Pavlova and Valeeva (2019), the application of FC model proves effectiveness in the teaching English for specific purposes. With regard to its benefits, they shed the light on the most significant are the following: Maximizing learners' motivation

towards foreign language learning, using authentic specialized educational materials and texts, improving students' communication skills, fostering individualized learning (Pavlova & Valeeva, 2019). Abdullah et al. (2019) confirm that FC Significantly diminish learners' anxiety while engaging in English speaking performance (Liu et al., 2022).

ESP learners intend to develop and practise their language skills to be more competitive and successful in their future profession (Berdiyorova, 2021; Pavlova & Valeeva, 2019). Accordingly, the implementation of FC seems to enhance the situation of ESP through its potential to "redirect the attention in a classroom away from the teacher and onto the learners and the learning" (Bergmann & Sams, 2012, p. 96).

Pavlova and Valeeva (2019) present an instance of FC model in ESP class. They implement FC to design and teach English in ecology classes, with a special focus on teaching a course on annotating (i.e. adding explanatory notes) and summarizing specialized texts for ecology Master's students. During the pre-class phase, the instructor provides the following materials for the learners via email, website, or online teaching platform: A textbook section, a clichés and vocabulary list, and reading comprehension test of an authentic scientific article on environmental issues.

3.17. Technologies and Learning Activities in Flipped ESP Classes

As far as the instructional materials are concerned in flipped ESP classes, Motteram (2016) believes that many educators are searching for efficient ways to improve or enriching their regular classes with technology. Vavilina (2020) believes that the use of technology in the ESP context should be seen as "the most powerful means to empower learners and develop interdisciplinary competences" (p. 179). The adoption of tech in ESP context is triggered by innovations in the means of communication, emergence of content management systems (e.g. Moodle) and the use of a widespread variety of devices in order to access knowledge and participate in virtual communities.

As noted by Woodrow (2018), technologies in ESP present a set of advantages. First, they give learners the opportunity to access authentic materials and interact with real-world texts and tools related to their specific academic disciplines as well as enhancing their contextual understanding. Second, they provide a great variety of collaboration and communication tools (e.g. video conferencing, discussion forums) which foster active learning through group work and immediate feedback. Moreover, they enhance personalized learning; Learning Management Systems, for instance, makes it possible to trace learners' advancement and tailor content delivery strategies and assessment techniques accordingly. Further, technologies simplify the smoothness of assessment through automated grading techniques and online quizzes. Another benefit of technologies in language classes is made available by the interactive practice tools for learning such as Kahoot! (Interactive quizzes through gaming), Duolingo (gamified activities application), Moodle (open-access learning sources platform), etc.

As far as enhancing ESP course design in relation to FC is concerned, Woodrow (2018) sheds the light on the role of language corpora in evaluating online resources for ESP. These large collections of texts can be analysed by concordancing software (e.g. Wordsmith) in search for common field-specific words and phrases. In the same vein, Vavilina (2020) affirms that genre-based approach is "enhanced by the access to various specialized corpora via the Internet" (p. 170). The analysis of language use in specific genres enables instructors to focus on the most relevant linguistic features and meet learners' needs through employing tailored authentic materials when designing specialized courses. This empowers them to select the appropriate instructional materials to enhance the quality of ESP learning.

Pavlova and Valeeva (2019) present an instance of FC model in ESP class. They implement FC to design and teach English in ecology classes, with a special focus on teaching a course on annotating (i.e. adding explanatory notes) and summarizing specialized

texts for ecology Master's students. During the pre-class phase, the instructor provides the following materials for the learners via email, website, or online teaching platform: A textbook section, a clichés and vocabulary list, and reading comprehension test of an authentic scientific article on environmental issues.

As for the learning activities in ESP environment using FCM, language learning opportunities in technologically-enhanced as well as traditional classrooms intend to foster learners' proficiency "through interactive, meaningful, and cognitively engaging learning experiences, facilitated by a qualified language teacher" (Kessler, 2016, p. 60). By involving students in simulation and other meaningful activities specific to their specialty, technological tools and resources enable learners' access to the content knowledge in language classes (Vavilina, 2020).

Another instance of ESP learning activities in the context of FC are the micro- lessons used in the study of Liu et al. (2022). These researchers assign students to watch pre-recorded short lecture-format videos addressing key features of English news to learn in the pre-class phase. Bergmann and Sams (2012) describe learners' activities in flipped classes as viewing the videos and asking appropriate questions to get teacher's expert feedback. They also highlight students' responsibility for achieving and sharing their work.

3.18. Flipped Classroom as a Means for Developing 21st Century Skills

Dudeney and Hockly (2016) affirm that the "21st-century skills are starting to appear in curricula around the world as governments, education authorities and educators recognise a need to equip learners with new skills to complement the old" (pp. 116- 117). They indicate that there is a shift in emphasis from traditional skills of reading, writing and arithmetic to providing the youth with the essential competencies to cope with the modern interconnected world and aspire of novel jobs. This is asserted by Pegrum et al. (2014) when they depict those skills as "that students (and their teachers) need to acquire if they are to access the

educational opportunities that new technologies offer and become engaged citizens and effective employees in our digitally networked world" (p. ix). They define them as "the individual and social skills needed to effectively interpret, manage, share and create meaning in the growing range of digital communication channels" (p. 2).

Mitsiou (2019) argues that FC supports the acquisition of the 21st century skills. The latter prepare learners for social and professional inclusion which can be fostered by the adoption of the FCM. First, it focuses on active learning through engaging learners in autonomous understanding the instructional material. Second, it entails learners' completion of practical in-class activities through analysis, evaluation, and solving the problems presented in those tasks. Third, it creates a collaborative learning atmosphere and fosters communication skills through engaging learners in group work activities, conducting a dialogue with struggling learners about their misconceptions or asking questions to teacher. In addition, it encourages creativity among learners in their way to find innovative and effective methods of learning. Furthermore, it enhances students' motivation, confidence and responsibility towards their own learning through accessing materials independently at their own pace. Another skill that is enhanced by the FC is the development of learners' reflection on their learning process to understand their learning style and adapt their habits accordingly. Lastly, it develops learners' adaptability to the efficient use of the rapidly and constantly progressing technological tools and resources for better learning quality.

3.19. Considerations for Effective Flipped ESP Classes

Liu et al., (2022) state that effective flipped instruction in ESP classes entails teachers to have both the necessary technological literacy along with a deep understanding of ESP content and learners' features (e.g. specific needs, backgrounds, lacks, wants and perspectives). Similarly, Kessler (2016) points out to the significance of language teachers' pedagogical knowledge and technological skills for an effective teaching practice.

Additionally, Pegrum et al. (2014) state that language teachers' skills have become more essential in the current era of digital networking prevalence.

Kessler (2016) clarifies that teacher's preparation involves selecting the relevant technologies to be integrated, the appropriate teaching strategies as well as the skills addressed by preparation and planning. The latter include classroom activities management, maintaining learner records, providing feedback, organizing and effectively selecting individualized materials, coordinating digital communication skills including emails and online discussions, controlling group assignments. Another aspect related to the use of digital technologies while learning is related to the risks caused by internet. Healey (2016) claims that internet users (teachers and learners in our case) need to have the necessary knowledge about safety issues and their corresponding appropriate behaviour to manage the risks of constant connectivity

According to Dudeney and Hockly (2016), Prensky (2001) has coined the term 'digital natives' to refer to people who were born into a world already buzzing with modern technologies and connectivity. Likewise, they have distinguished them from 'digital immigrants' to describe the individuals born prior to the digital age. They state that surveys disprove the assumption that individuals are competent in all technologies or 'tech savvy' simply because they heavily rely on mobile phones. Rather, those individuals need to acquire the digital literacies and 21st century skills to be labeled as such. Thus, Dudeney and Hockly (2016) suggest that it is instructors' role to change the use of technology from being primarily of practical and social nature to become more pedagogically-oriented.

When addressing issues related to technology and ESP, Woodrow (2018) recommends course designers to avoid using technology only for its novelty. In some cases, traditional materials are likely to be more appropriate considering the target course and audience. In this context, Woodrow (2018) contends that technology is not widely available and internet

connections is unreliable in a number of countries. Consequently, this would affect ESP learners as well as practitioners. ESP learners from underdeveloped areas may not possess the technological competencies required to participate in an ESP course in more advanced countries. Teachers may be reluctant to integrate new technologies due to insufficient confidence or shortage of time.

Interestingly, the founders of FC have received reports and questions about the obstacles faced by number of teachers who implemented FCM. In their book, Bergmann and Sams (2012) present those issues in questions format accompanied with the solutions they suggest. In the upcoming points, we summarize them while replacing the researchers' original used material 'videos' by the 'target or educational content' in general. First, learners who have no computers at home can access the pre-class learning content in different locations where it is posted by the instructor (e.g. computers at school library, community centres allowing students' access to computers, or uploading them to YouTube to be viewed on phones, etc). Second, loading the videos or any educational content on flash drives or personal devices (e.g. their iPods, cell phones) to be viewed at home is appropriate for learners with inadequate or no internet access.

Third, teachers should have supervision methods to check learners' effective engagement with the target content. One way is the use of a website requiring students' log in to view the content. This high-tech tool would also allow teachers to check the viewing log for participating learners. Another suggested strategy is checking the notes taken by the learners after engaging with the target content. Notes can be in several forms, notably paper notes, posting comments on a blog or emailing their teacher to ask interesting questions. In this way, all students -including shy and disengaged ones-are engaged and able to interact about the target topic.

With regard to the confusion related to the ideal length of the videos to be used,

Bergmann and Sams (2012) prefer shorter ones with duration of 10 to 15 minutes and covering a single topic. A further point is raised as a drawback for FC. Pre-class assignments are criticized for being increasing homework time, especially when learners view the learning content several times. Yet, Bergmann and Sams (2012) confirm that students' video or content viewing time is approximately equal to their homework performance time.

As for the criteria determining the appropriateness of the instructional materials, the developers of FC advise educators to rely on their professional judgment, to ask peers and mentors, and even ask for students' feedback about the issue. Further measures to ensure accessing high-quality learning activities, instructors can create their own content or employ content and videos produced by other talented teachers on the target subject.

Conclusion

The current chapter addresses the fundamental aspects related to the Flipped Classroom (FC) approach. It starts with a historical background of e-learning and the emergence of blended learning models including FC and the ways in which technological advancements have influenced higher education. Then, the FCM is defined as a recognized teaching model, though it has no unique way for flipping classes and several models are implemented. Additionally, the research presents the drives for transition to this pedagogical approach. Its original four pillars are extended by researchers other than its developers. They revise F-L-I-P and develop it to become F-L-I-P-P-E-D presenting the main aspects of FC. Moreover, this research compares of traditional classes and the flipped classroom model. Discussing the theoretical framework helps to describe its constructivist foundation in educational theory. Furthermore, Bloom's taxonomy proves to play a significant role in enhancing FC through determining the learning objectives of its online and in-person phases.

After a detailed presentation of the FCM, Chapter Three shifts to its implementation in the ESP classes. The employed materials in flipped ESP classes are described ranging from

the software such as apps, platforms, social media and the most recent emerging Artificial Intelligence on one hand and hardware on the other one. Fundamental criteria for selecting efficient technological materials for FC ESP classes are outlined. Interestingly, the stages of implementing FC in higher education begin with teacher's preparation or planning of the content and materials, assigning an online out-of-class work before the class phase, conducting discussions and doing hands-on activities either individually or in groups during class phase and ends up withpost class phase which is generally devoted for assessing learning process and learners' understanding of the addressed content. Further details are given about the types of assessment and learning activities employed in flipped ESP classes. FC also proves to serve as a means for fostering learners' 21st century skills. Finally, Chapter Three ends with a set of considerations to be taken into account to guarantee an effective application of FC.

Chapter Four

Chapter Four: Research Methodology Description

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Introduction

Over the span of this investigation, our position was not that of experts in the field of neither didactics nor course design. Rather, we claimed to be researchers who hoped to discover the rapid transformations occurring in the Algerian higher education in general and ESP classes of digital age in particular, to properly tackle them, and try to highlight any positive impacts on enhancing learning English. The chapter of methodology in this research provided a comprehensive depiction of the research nature and framework; the selected research approach; data collection tools and steps; population and sampling techniques; and data analysis methods and procedures for a better understanding of the topic; ethical considerations taken into account to ensure the validity and reliability of the study; the limitations confronting researchers. It also covered a section describing the ESP designed course conforming to the standards of FCM as well as the context where it was implemented within the Department of Drilling and Mechanics of Oil Fields. Moreover, the chapter gave justifications and shed the light on the motivations for opting for any of the choices made. In the current study, methodology chapter was very detailed and consisted of complex parts. Therefore, it was seen suitable to splitting it into two distinct sections with the aim of organizing the information clearly and logically.

Section 1: Defining the Methodological Landscape: Scope, Instruments and Limitations

4.1.1. Research Nature

This research was a mixed research case study as it consisted of combinations in all its components. Simons (2009) defines a case study as “an in-depth exploration from multiple perspectives of the complexity and uniqueness of a particular project, policy, institution, program or system in a “real life” context” (p. 21 as cited in Thomas, 2011, p. 512). For Yin (2009), a case study is an empirical inquiry examining or exploring a phenomenon within its

authentic context (as cited in Priya, 2021, p. 95) and " a de-contextualised study has no relevance in a case study research" (Priya, 2021, p. 96).

To that end, Priya (2021) clarifies that this type of research strategy employs various techniques and sources to collect data and evidence to answer the research questions. She claims that a case study methodology extends the dimensions or is larger in scope than being mere research method or technique of data collection. Additionally, it permits the implementation of any data collection method suitable to the research objectives.

Case study is also defined as "a design of inquiry found in many fields, especially evaluation, in which the researcher develops an in-depth analysis of a case, often a program, event, activity, process, or one or more individuals" (Creswell & Creswell, 2018). In our research project, the case study design of inquiry was chosen for its appropriateness to the investigations related to evaluation (Creswell & Creswell, 2018).

In the same vein, the course of our research was based on evaluating the quality of the relatively new educational method named flipped classroom in science and technology classes, notably oil drilling courses. It entailed studying and analyzing the incorporation and outcomes of using FC model in particular as an example of modern digital teaching approaches mainly due to the technological upheaval as well as the spread of Corona Virus since 2019. It intended to have an in-depth understanding of the possibility of enhancing the efficiency of ESP teaching in higher education.

4.1.2. Philosophical Framework: Deductive vs. Inductive Reasoning

Berwick (1989: 56-61) makes a distinction between inductive (i.e. observations and case studies from which courses can be generalised) and, more common, deductive methods (i.e. questionnaires, surveys or other data-gathering instruments which provide various forms of information as the basis of course design)

Within the scope of this study, we did not primarily progress deductively from general concepts or ideas to specific conclusions. Rather, we opted for inductive reasoning where at least two of its types were employed. Firstly, we utilized observations and gathered data about the selected sample to draw general inferences and conclusions about the broader population it represented. Secondly, we searched for any cause-and-effect ties between the implementation of FCM and improvements in the performance of the ESP teachers, skills of students and efficiency of the ESP courses in Oil Drilling Department.

4.1.3. Research Approach: Mixed Methods Research

Our research was a case study on FCM intervention's effects on an ESP course where both qualitative and quantitative data were gathered from research participants to gain insights into and comprehend the situation in terms of the attained findings such as any change in the level of educational engagement, motivation, behaviours, attitudes, and perspectives of the oil drilling students as well as the behaviours of the ESP instructor. Thus, a mixed-methods approach was utilized.

4.1.3.1. Quantitative Approach

For Creswell (2008), quantitative research is employed to test objective theories and find out any relationships between research variables. Accordingly, it tries to protect research from bias and allows replicating and generalizing of findings. In our research, the bias that would appear from the qualitative observation of the participants' classroom interactions was balanced by the conduct of its preceding questionnaire. The latter was used as support to build an observation checklist through highlighting or specifying the aspects to be prioritized during that process.

In the words of Chiang et al. (2015), "the strength of quantitative research is its ability to provide precise answers to specific research questions and to draw general conclusions about human behaviour" (p. 156). They add that this type of research is not proficient in

supplying “detailed descriptions of the behaviour of particular groups in particular situations” (Chiang et al., 2015, p. 156).

4.1.3.2. Qualitative Approach

Chiang et al. (2015) contend that “qualitative research can help researchers to generate new and interesting research questions and hypotheses” (p. 156). These researchers also draw insights of other researchers and criticize qualitative methods many perceived shortcomings: First, they are likely to be subjective in nature and unbiased in perspective; second, it is challenging to assess their reliability and validity; third, they are characterized by the lack of generalizability to other or wider range of individuals or settings beyond the case under investigation.

However, qualitative researches are characterized by being conducted at their natural setting rather than taking the research subjects to the lab. This allows a direct contact with the research participants as well as observing or witnessing research procedures.

4.1.3.3. Rationale for Integrating Qualitative and Quantitative Data

Johnson and Christensen (2017) explain the researchers’ motives to sometimes blend the qualitative and quantitative approaches. They briefly affirm that “often quantitative methods are used to examine the objectives, while qualitative methods are used to understand the objectives and outcomes in a deeper way and to explore for other unanticipated outcomes” (p. 178).

Putting these principles into practice in our research, the quantitative part of the post-study questionnaire ‘measured or evaluated’ the extent to which the objectives of FC approach were achieved. This would appear in, say, the participants’ motivation and engagement level in the three phases of the educational model as well as the scale of understanding of the presented content.

From a different angle, the open-ended questions as a qualitative part of the previously

mentioned research tool ‘explored’ the learners’ experiences and attitudes towards FC and were able to discover any unpredicted or unplanned effects of this approach in the context of oil drilling.

To avoid the weaknesses of both approaches, Chiang et al. (2015) believe that the issues of objectivity, reliability, validity, and generalizability have to be considered when conducting qualitative researches. On the flip side, quantitative researchers have not to oversimplify the complexity of human behaviour and experiences into a few number of variables and statistical associations among them.

4.1.3.4. Mixed Methods Approach

Thus, mixed methods approach was the most fitting to our multi-faceted study concerned with depicting the research participants, setting, the design and instruction of FC intervention for the oil drilling class, observing the participants’ behaviours and perspectives while conducting the study, recording any emerging changes or relations among the variables, in addition to recommend issues about the most effective educational method considering the case of the Department of Drilling and Mechanics of Oil Fields specifically and the Algerian higher education context in general.

Creswell (2009) depicts mixed methods research in the social and human sciences as “employing the combination of quantitative and qualitative approaches” (Chapter Ten: Mixed Methods Procedures). In Mertens’ (2024) assertion, mixed methods is defined as “the inclusion of both quantitative and qualitative methods in a single study or a sequence of studies” (3, p. 2). Its purpose is best portrayed by Johnson and Christensen (2017) when they state:

> A key point to know now is that you will (a) collect quantitative data to measure what you are interested in studying and (b) collect qualitative data to help you understand the meanings of what takes place and to hear what your participants think in their own

words. (p. 178)

Mertens (2023) affirms that mixed methods research assists to "collect data that can capture the multiple aspects of a phenomenon and provide a basis for the development of solutions that have the potential to create needed changes" (p. 2). Kimmons (2022) claims that mixed methods design helps at "solving educational problems in more authentic and situated ways and can provide evidence that appeals to a wide array of stakeholders" (p. 137).

In our case, the raised problem to be solved was facing any future situation that may make face-to-face education impossible as was the case with Covid-19. In addition, we sought to find effective educational approaches which may make the Algerian universities competitive on the international academic and workplace level and meet the requirements of the 21st Century.

Creswell (2009) presents a list of the features and criteria characterizing mixed methods approach and encourages researchers to select it. First, it depends on the strengths of both qualitative and quantitative types of research. Second, this approach is more adequate to tackle the complexity embedded into the social sciences studies than either approach by itself. Third, combining both approaches provides a comprehensive understanding of the topic under study more than what can be gained from the use of each of the approaches in isolation.

In line with what preceded, we opted for mixed-methods research. It combined both qual-quant research approaches. For Creswell and Plano Clark (2007), this combination strengthens the study more than using either qualitative or quantitative form. Therefore, it tended to result in a more comprehensive understanding of the phenomenon under investigation.

According to Chiang et al. (2015), mixed-methods studies employ qualitative approach for generating hypotheses and quantitative one to test them. It was also in the core of our study in that it was appropriate for combining data from different sources and

reinforcing and validating the findings. Creswell (2015) suggests that both qualitative and quantitative data collection tools are employed in parallel or sequentially. The former served at collecting data on the respondents' perspectives, experience, and attitudes towards the main aspects of the study. The latter was significant in terms of gathering static information about the participants and the course in the form of numerical data

Creswell (2009) also focuses on the weight or priority given to the qualitative or quantitative approaches during the research. In the current study, both were given equal priority. Moreover, the research methods were conducted sequentially. For Creswell (2009), data can be collected either concurrently or sequentially in mixed-methods researches, i.e. the qualitative and quantitative data collection is done simultaneously or in phases.

In our investigation, this process was done sequentially. The data obtained from needs analysis questionnaire, analysis of the department's English syllabus and teacher's interview supplied the next step -designing the oil drilling course and classroom observation checklist- with the necessary details and criteria to be done systematically. In addition, post study questionnaire (quantitative data) and teacher interview (qualitative data) were informed by the previously conducted two steps. The data obtained from each phase informed and served as a foundation for the subsequent one forming a progressive sequence.

4.1.4. Research Design: Integrating Quasi-Experimental and Action Research Designs

In the words of Singh (2023), "a research design is the plan or framework used to conduct a research study". She affirms that it presents the general outline of the selected research approaches and methods required for data collection and analysis, aiming to address the formulated research questions or the suggested hypotheses. Along similar lines, Hancock and Algozzine (2006) contend that this plan can be employed to explain the way in which the major components of the research mainly "the samples or groups, measures, treatments, or

programs and methods of assignment" (p. 86) are designed in one structure to provide a reliable answer to the research questions.

4.1.4.1. Action Research

The researcher went with the employment of the methodology of action research. This was due to the novelty of the FCM in the Algerian context. That is, this methodology was implemented and its outcomes were observed on one hand and the desire to find out the most effective methods to improve students' educational level on another side.

The action research comprises "phases which are repeated in a cycle, since the researcher must collect information, then adapt and restructure his/her methods. The aim is to continually improve the actions in order to achieve higher quality results through the educational process" (Horváthová & Naďová, 2021, p. 5). In other words, action research intends to improve the quality of results in education by continuously refining actions. The researcher identified a problem, limited it, gathered data, analyzed and interpreted the results, and opted for the most suitable strategy to be applied in the educational process.

Johnson and Christensen (2017) present action research as a process of phases taking the form of a cycle: reflection, planning, action, and observation. They contend that researchers may initiate their engagement at any point of the cycle considering the context and their specific objectives. They also claim that the researchers can circle back to other earlier stages or commence a new circle to continuously enhance what they have already accomplished.

The current study's scope was well-suited to the principles of action research. This can be a non-negotiable step as it aimed at addressing the problem of modern educational approaches in the Algerian universities. This issue has come to the surface after the international health crisis of Covid-19 when all educational institutions were closed and the governments found online instruction as the only existing option to avoid suspending classes.

First, the researcher conducted a literature review to examine existing scholarly publications and databases of scientific studies in order to decide whether the topic has been tackled before and find out any proposed solutions to be implemented in our case.

In the next stage, the researcher diagnosed the suggested research problem concerning the existence of an ESP course in the Department of Oil Drilling and the methodology employed for its teaching. This was done through asking administrators, teachers and students of the department about the situation of English and its courses there. Departing from understanding the general conditions in this situation, the researcher planned and conducted the present action research study to uncover the ways in which FCM can be implemented in the Algerian higher education context and the extent of its effectiveness.

The planning phase was followed by the application one. An ESP course was designed based on the findings of assessing learners' needs and implemented with Master 1 oil drilling class. The third stage was concerned with observing the procedures of the FC intervention to determine its impact on the performance of the learners and their teacher. To that end, several data collection tools (questionnaires, classroom observations, interviews, document analysis…) were employed to evaluate learners' and instructor's engagement in the course. Moreover, data were analysed and interpreted.

In the reflection phase, conclusions were made about the effectiveness and limitations of the incorporated type of blended learning approach. Furthermore, implications were presented to enhance the effectiveness of this educational method in the Algerian context. Lastly, reflections on the way an efficient plan to accomplish better results can be provided.

Action research use was apparent in several stages in this study. First, the research design sought bringing about efficient practical change for real situation through collaborative and interactive measures. Second, collecting data depended essentially on the learners' and teacher' participation and engagement in the whole process via their assistance at

implementing the FCM and then describing their teaching-learning interactions, experiences, attitudes and evaluation by the scheduled program.

At the time of the research conduct, there was no specific designed course for Oil Drilling students at Kasdi Merbah University. Already published books were used as the major reference for ESP sessions to be presented through conventional educational approaches. The current research brought about changes to that course and suggested another one depending on the learners' needs and FCM's guidelines. Then, any differences, being them positive or negative, would be recorded and reported.

4.1.4.2. Quasi-Experimental Research Design

In conjunction with action research framework, this study used the quasi-experimental design to evaluate the effectiveness of blended learning in general and specifying FC model as a case study. The experimental design proved unfeasible for this particular case due to the impracticality of assigning the participants into experimental and control groups. This constraint arose from the departments' scheduling of the ESP session for the whole batch or cohort in one room simultaneously during the exceptional sessions, making it impossible for the researcher to create distinct groups for experimental manipulation and control conditions. In addition, forming such groups would cause unreliable findings as it was difficult to prove their equality. Furthermore, ESP lessons were taken online (except for the exceptional scheduled sessions to conduct our study).

Quasi-experimental research is a non-experimental research. Generally speaking, the latter "lacks the manipulation of an independent variable, random assignment of participants to conditions or orders of conditions, or both" (Chiang et al., 2015, p. 137). In our case, the research question was about a causal relationship, but the participants cannot be randomly assigned to experimental and control groups. That is, it was impossible to randomly assign the participants to different conditions. Therefore, the study relied on the existing conditions.

Quasi-experimental research is lower in internal validity compared to experimental research (Chiang et al., 2015).

These methods are commonly employed to make causal inferences in social sciences studies. In this research, this design aimed at establishing the existence of any cause-effect relationship between the study variables: the effectiveness of ESP course and FC teaching approach.

Pret-post study quasi-experimental design entailed measuring the outcome or dependent variable before and after the action research FC intervention to determine any changes in learners' and ESP practitioners' attitudes over time towards teaching ESP. Because quasi-experiments are criticised for having the limitation of bias unlike randomised designs, many research instruments were used to keep the research findings as objective and reliable as possible.

4.1.4.3. Integrating Quasi-Experimental and Action Research Designs

Incorporating elements from action research and quasi-experimental research designs was opted for to answer the research questions matched to the extent of FC efficiency in ESP classes. And, it aimed to meet the research objectives of the study through establishing any cause-effect links between the implementation of FC approach and the quality of ESP instruction.

The employment of these two designs had the following benefits in the context of our investigation:

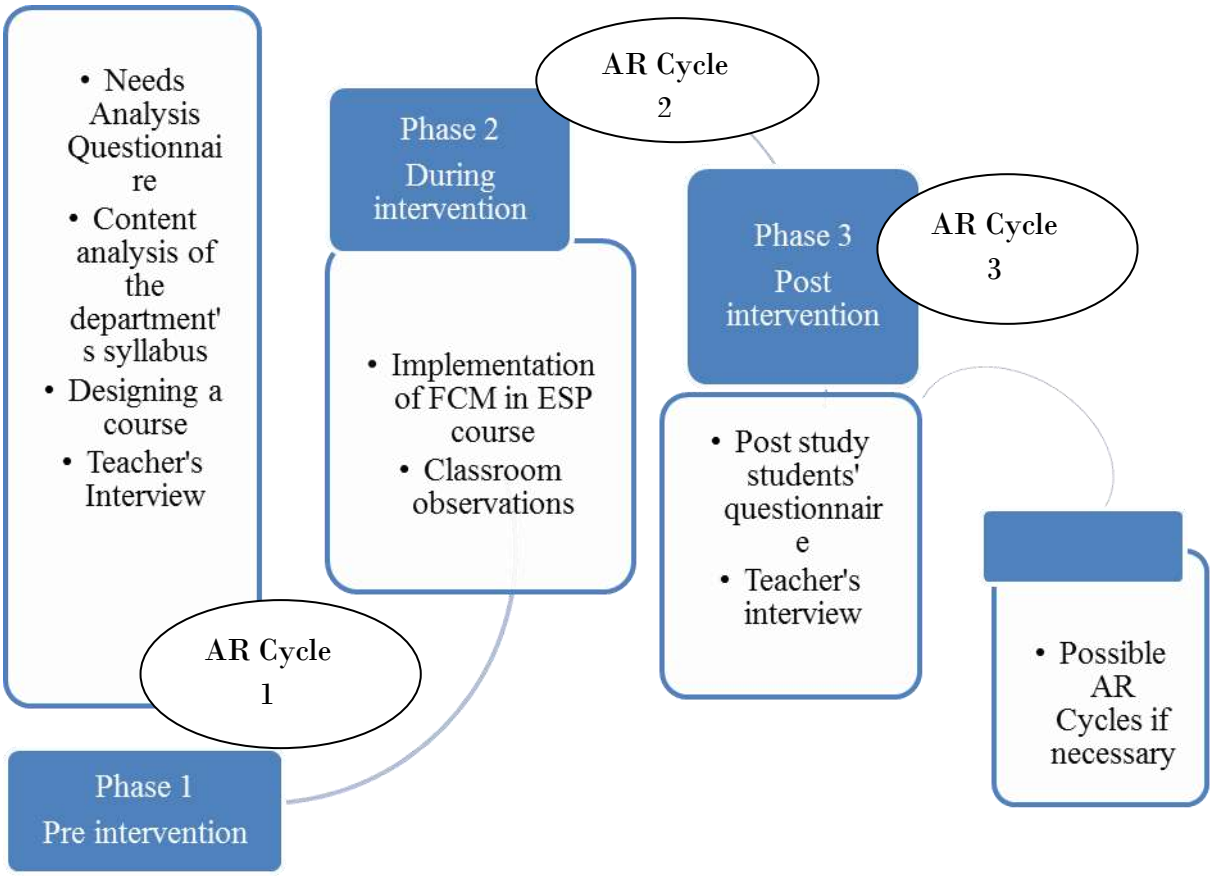
- While action research was concerned with the process of designing and implementing FC intervention in the context of Oil Drilling Department at Ouargla University to address the issue of ideal ESP teaching approach in the digital age, the quasi-experimental component focused on the measurement of the extent of the effectiveness of that intervention through the comparison of the pre-post study participants' responses in order to determine the

extent of changes in their attitudes and performance as a consequence of implementing FCM in the target ESP class.

- Action research looked for practical solutions to teaching ESP in the Algerian context regarding the situation created by Covid-19 along with the emergence of a digitally native generation of learners. However, quasi-experimental intended to establish causal relationships between FC implementation and any changes in the ESP classes.
- Unlike the findings drawn from action research that were limited to the designed and taught oil drilling course, the quasi-experimental maximized the possibility of transferring research findings to similar educational contexts or disciplines.

Figure 143

Methodological Framework for Action Research (AR) Implementation in Flipped ESP Course



4.1.5. Research Setting and Participants

4.1.5.1. Setting

This study was conducted at Kasdi Merbah Ouargla University, the Hydrocarbons Faculty, exactly at the Department of Drilling and Mechanics of Oil Fields during the academic year 2023- 2024. It was divided on both semesters with exam 1 as an interval. For 4 weeks, the selected sample was taught using FCM by the ESP instructors with the assistance of the researcher who designed the lessons and attended the sessions to conduct classroom observation. Face-to-face sessions took place in a long room with enough seats for the selected sample.

We launched this part with the description of the setting and general context where the study took place. ESP was taught as a semestrial module with a very low coefficient (01) and a broaden use of English in the majority of modules. In the previous years, it was totally instructed through conventional teaching-learning practices.

For the academic year 2023-2024, considering it an interdisciplinary module, it was fully instructed online. So, we were obliged to program special in-person sessions within the timeframe of the first semester leaving the conduct of the post study part into the beginning of the second semester. The most important point to raise here was that the status of English shifted to become English as a Medium of Instruction (EMI) rather than ESP. It was indeed EMI as the teachers in this department used English in their classes.

The setting limited our study by the time constraint. Learners did not start studying English early as the enrolment of students seeking the pursuit of their Master's studies lasted for relatively long period. So, we were compelled to carry it out as soon as possible and within a few sessions.

The most prominent feature was the great facilities provided by all department workers, being them teachers, administrators, or head of the department. The latter signed the

consent (Appendix A) to conduct the study and showed a great interest in the study itself asking questions in the core of the research. Upon coordination with the supervisor, he also officially scheduled special face-to-face sessions. He gave orders to the secretary to announce the date and timing of the sessions on the departments' Facebook page.

On their part, the two ESP teachers had provided a great help. Both of them showed an immense readiness to program meetings with the researchers or reply to phone or WhatsApp calls and messages whenever necessary. They also offered insightful answers on the interview questions within the limits of their experiences in teaching ESP in this department. However, the mission was divided between them.

However, the mission of presenting the ESP sessions was divided between them. The first instructor served as the official MA1 teacher, but had to cease teaching due to their travel to France for a training program funded by a scholarship. Nevertheless, we counted on his experience to offer detailed information on the ESP online sessions conducted via Google Meet. Those sessions were a valuable chance for MA students to interact and engage in discussions with international experts in the field of hydrocarbons. Additionally, he forwarded the needs analysis and post-study questionnaires to the batch delegate via email to be distributed to the oil drilling learners. He accepted our attendance of the first sessions where the guidelines of the ESP sessions were explained. He also provided the needed expertise of a content expert which stands at the core of ESP course building. He kindly copied and sent the ESP syllabus provided by the department to the researcher who took the responsibility of developing its lessons.

On her hand, the second teacher took on a volunteering role. She created a messenger group to keep in touch with the learners during the pre and post class phases. She also helped at sending the digital presession content via collected learners' emails. She presented the three conventional sessions during the absence of the ESP teacher, enabling the researcher to

conduct classroom observation easily. Her contribution facilitated the researcher's role and limited it to observing only rather than assuming both roles simultaneously. This also served at reducing researcher's subjectivity and bias towards her own performance during the session. Besides, it enhances the researcher's mission by optimizing the focus on the elements included in the observation checklist to assess their fulfilment during the conducted sessions. She also answered the post study questionnaire and expressed her attitudes towards the designed and implemented ESP course along with the effectiveness of digital tools, resources and teaching trends in the current context.

4.1.5.2. Sampling

4.1.5.2.1. Research Population and Sample Size

As part of 'projet d'entreprise' adopted by the Algerian policy makers, higher education faculties have been the subject of increased attention and emphasis. In an educational context, this strategic initiative has aimed to link the educational institutions to business ones through encouraging and supporting the projects introduced by students. To that end, the spirit of entrepreneurship has been cultivated via enhancing the quality of those institution's curricula, teaching resources and practices. Thus, this study was a case in point that exemplified the ongoing reforms and implementation of educational programs and methods. It aligned with the integration of digital technologies in ESP classes and showcased the adoption of blended learning types in Algerian universities as a response to Covid-19 pandemic and digital revolution. Our study was conducted within the faculty of Hydrocarbons at the University of Kasdi Merbah in Ouargla during the academic year 2023- 2024.

According to Babbie (2009), "A study population is the aggregation of elements from which the sample is actually selected" (p. 146). Put it differently, sampling involves studying a subset of a larger population aiming to derive insightful and valid findings or conclusions that can be generalized to the broader population.

The informants in this case study were non-randomly selected. A total of 106 students among which were 102 males and 4 females and their 2 ESP teachers were our population for this research. All participants were Algerians. Their native language was Arabic.

Oil drilling specialty was mainly chosen by the males for some reasons stated by one the ESP teacher as an engineer in this discipline. First, it depends heavily on field work either in the course of their academic studies or in the future career. Therefore, women's involvement in such jobs is limited due to cultural and Islamic religious considerations mainly travel restrictions, inability to work in mixed teams, etc. They may feel uncomfortable in a male-dominated work environment. Third, oil drilling industries and professions are physically demanding tasks, notably working and living in isolated sites, handling heavy machinery, and tolerating harsh climate circumstances. This does not fit their physical abilities.

4.1.5.2.2. Sampling Technique

According to Babbie (2009), "sampling affords the social scientist the capability of describing a larger population based on only a selected portion of that population" (p. 145). In Babbie's (2009) perspective, "a sample is considered representative of the population from which it is selected if the aggregate characteristics of the sample closely approximate those same aggregate characteristics in the population" (p. 145-146).

Comparing to convenience sampling which depends on the easy availability and accessibility of the research participants, the non-probability purposive sampling technique requires researchers to "select individuals who will best help them understand the research problem and the research questions" (Creswell, 2009). Babbie (2009) affirms that "purposive (or judgmental) sampling occurs when a researcher selects a sample based on his or her own knowledge of the population, its elements, or the nature of the research study" (p. 145).

Furthermore, because it was not difficult to locate the sample members and the study was not purely qualitative, snowball sampling was not appropriate in our case. The participants were intended to represent a range of attitudes towards blended learning and teaching styles based on their own experiences of the implemented course and teaching approach.

Within our context, the technique employed in the selection of the participants was purposive sampling. According to the guidelines of this strategy, Stockemer (2019) claims that "subjects are selected because of some characteristics, which the researcher predetermines before the study. Purposive sampling can be very useful in situations where the researcher needs information for a specific target group" (p. 63). It was based on the researcher's deliberate choice of the individuals possessing the required qualities and the valuable insights they could provide following a sampling frame.

In our case, learners' attendance during English sessions served as the basis for selecting the sample. This would guarantee their participation in the face-to-face phase of FCM. They were assigned to one group as the additional sessions were taking place in one classroom rather than being split into separate groups. They were taught by the same teachers and took the same English course within the course of this study. They were exposed to the designed flipped classroom ESP course.

Babbie (2009) affirms that "unless a sample represents five percent or more of the population it is drawn from, that proportion is irrelevant" (p. 147). Our sample meeting the determined criteria accounted for a percentage of 29.25% of the whole population. The students selected meeting the requirements of the study were 31 out of a total population of 106 students along with two ESP teachers.

4.1.5.2.3. Accessing Participants

- **Students**

The recruited participants formally declared their consent to participate as respondents in this study. Once they replied to the needs analysis questionnaire, these participants demonstrated their voluntary agreement to participate by selecting the affirmative option 'Yes' in the initial section of the questionnaire.

With the flipped classroom approach, the lessons were tailored to suit different learning needs, styles and pace. Students had the opportunity to skip or replay videos or had access to the uploaded documents whenever and wherever they needed. The native language of the learners is Arabic. They were taught by two instructors, ESP teacher for online sessions and the researcher for the exceptional face-to-face classes. The most important fact to highlight was that it was the first time to implement FCM in this discipline.

- **ESP Teachers**

A visit to the Department of Mechanics and Drilling of Oil Fields was arranged. It aimed at making a request for obtaining permission to conduct the study. In addition, the official teacher of English was accessible on the phone. The teachers had experienced teaching ESP in the hydrocarbons faculty. He stated that ESP was used to be taught in-presence, but for this academic year it was scheduled to be fully online. This was due to two main reasons: English was a secondary subject matter and freeing the rooms for the principal modules. However, he programmed the first sessions to train the learners about subscribing in Moodle and explaining the ways of using it in case of uploading new resources (e.g. PPT presentations and lectures) by the teacher. Google Meet was the selected platform to teach online.

By the time of implementing the designed flipped course, this teacher was obliged to travel for an advanced training. A female teacher in the target department showed readiness to volunteer as a substitute teacher for the exceptional face-to-face sessions once asked by the researchers.

Therefore, the technique used in this research was purposive sampling, depending on the principle of their experience in the target department. It would allow obtaining a comprehensive perspective of all individuals involved in the teaching-learning process.

4.1.5.3. Data Collection Tools

According to Leavy (2017), research tools cover all instruments and protocols used in the project being them quantitative such as pretests, posttests, surveys or qualitative like interviews. Several data collection tools were designed and employed in this study to gather information about the target university students' and teachers' experiences and attitudes towards the use of modern educational methods in ESP classes. Pre- and post-study questionnaires and interviews, during study classroom observations, oil drilling documents content analysis along with the observation of learners' online interactions were all employed to guarantee research validity and capture the appropriate information.

Opting for the use of interviews and questionnaires in our study was justified by the advantages and shortcomings of both research tools synthesized by Basturkmen (2010) out of Kumar's (1996) work; the former requires a short time to be administered whatever number of the respondents is; their anonymous nature encourages the study participants to express their opinions and ideas frankly. Nonetheless, interviews allow an in-depth understanding of the respondents' provided perspectives and information through follow-up queries on one hand and an opportunity for them to ask for more clarification for the investigator's questions. Accordingly, these data collection types are employed in this method: questionnaires with students and interviews with the ESP teacher.

4.1.5.3.1. Pre- and Post-Intervention Data Collection Tools

Student Needs Analysis and Post-Study Questionnaires

The research intended to compile information on the effectiveness of FCM as an educational approach in ESP courses. Needs analysis questionnaire (Appendix E) was

administered online using Google Forms. It was designed by the researcher and validated by the supervisor. Its link was forwarded by the ESP teacher via emails obtained from MA-1 students recorded in the attendance sheet of the first conventional class.

NA questionnaire aimed at determining learners' needs and identifying their attitudes, experiences and perspectives from learning English along with their background and experiences with the use of digital tools and resources in their studies. Over the results of this analysis, the content of the ESP course was designed and presented. Then, these students undertook that content through the new target teaching approach: FCM.

Needs analysis was implemented as a pretest for learners' attitudes and expectations from ESP learning using the FC model. The questionnaire was divided into two parts. The first part was mainly about the learners' basic personal information including gender, background and level in English language. The second part was concerned with the study skills, learning methods preferences and learning experience using technology in ESP classes. It also reflected the 21st century skills adoption in the whole ESP session. This questionnaire was conducted before the implementation of the inverted educational approach to serve as evidence of any differences when comparing learners' answers before and after the intervention.

NA questionnaire was administered before implementing the designed course by the beginning of the academic year 2023-2024. In the aftermath of the intervention, a post study student questionnaire (Apendix K) was employed as other data collection tools to pursue the participants' attitudes, feedback, opinions, impressions and expectations from integrating FC in teaching ESP. That is, it offered them an opportunity to evaluate the level of the designed course success, experiences with the FCM, and adoption of this teaching approach in relation to adult learners' satisfaction and fostering of 21st century skills. This questionnaire was designed and administered using Google Forms. Then, it was sent to the selected sample of oil

drilling Master-1 learners via their email addresses to complete it. The responses were automatically collected in a connected spreadsheet.This final questionnaire took place a short period after the end of applying the course.

Another point to consider when describing the pre-study questionnaires was related to their items which were developed and adopted based on relevant concepts from existing literature in the field of implementing FC and ESP teaching, such as Johnson (2013) and Salas-Rueda and Ramírez Ortega (2021).

As for the types of questions employed in student needs analysis and post-study questionnaires, both questionnaires consisted of a blend of qualitative (one open-ended) and quantitative (closed-ended) questions. Common employed question types were: Multiple-choice questions, Likert Scale, open-ended questions, closed-ended questions and Matrix Table questions. Multiple-choice questionswere either one single answer or multiple answers. Open-ended questions and closed-ended questions are distinguished by Stockemer (2019) through stating that “open-ended questions allow respondents to come up with their own answers in their own words, while closed-ended questions require them to select an answer from a set of predetermined choices” (p. 42). According to Bowling (1997) and Burns and Grove (1997), “Likert Scales use fixed choice response formats and are designed to measure attitudes or opinions” (as cited in Stockemer, 2019, p. 42). The respondents were provided by a choice of five factors assuming the strength of the attitude or agreement out of their own experience. They can also express their neutrality when they opt for no preference.

Matrix Table Questions were another type of questions used in this study’s questionnaires. These questions took a tabular format. They comprised “multiple questions with the same response choices. The questions are normally connected to each other” (Stockemer, 2019, p. 50).

The accompanying options following the questions of the designed questionnaires were set after reviewing literature in the field of ESP and technology-based teaching approaches. The option “other” was highly focused in search of deep expression of the study participants’ own experiences, thoughts, beliefs, feedback and attitudes with no bias to the study objectives or researchers’ position.

These types of questions aimed at making the respondents’ mission easier through just ticking the appropriate options, saving their time and minimizing ambiguity of the questions and their accompanied options. Furthermore, they facilitated the investigators’ task of the collected data analysis by identifying any existing or unexpected patterns and themes.

ESP Teacher Pre- and Post- Study Interviews

Chiang et al. (2015) identifies two types of interviews. He states that "interviews in qualitative research can be unstructured—consisting of a small number of general questions or prompts that allow participants to talk about what is of interest to them–or structured, where there is a strict script that the interviewer does not deviate from” (Chiang et al., 2015, p. 157).

Semi-structured interviews were other data collection instruments employed in this study, along with the previously described questionnaires. This type of interviews was chosen as it provided a great deal of flexibility and allowed modifying or restructuring questions throughout the interview depending on the interviewee’s previous replies. On the other hand, it helped the interviewer to maintain control over the flow of questioning-responding throughout the interview.

In the current study, most of the interviews items were administered face-to-face providing the interviewees enough time to think over answers. However, part of the interviews was done on the phone after ensuring the availability of the ESP teachers as per a previously arranged appointment. The pre- and post-study interviews (Appendices D & M)

were conducted with a very small sample because the ESP teachers were part-time teachers with non-permanent contracts in such departments where English was taught as a secondary academic module. That is, it was difficult to find experienced full-time teachers there. The most important specificity of our study was the way the interviewed teachers were selected. We started the conduct of our research with Teacher B as the official teacher of ESP to Master-1 students. By the time of the implementation of the designed flipped course, Teacher B travelled for other academic commitments. Then, Teacher A showed readiness to volunteer to teach those students. Consequently, the study started by interviewing both teachers and ended with interviewing Teacher A. Teachers answers were transcribed by the researchers to be analysed later.

The interviews were built according to the framework provided by Creswell (2007), including the following components: a heading (date, place, researcher as interviewee and teacher as interviewed); instructions to the interviewed explaining the procedures to be traced during the whole process; arrangement of the questions so that logic sequencing can be guaranteed; follow-up questions asking for more explanation or clarification; ending by thanking the interviewed to acknowledge the precious time spared to help the researcher in the study.

The pre-study interview covered a range of themes, including background information about the teachers' age, gender, educational qualifications, and years of teaching experience. It also tackled the teacher's preferences in terms of teaching methods, the type of English taught, and its relevance to students' academic discipline. As for the content of the post-study interview, it investigated ESP teacher's (Teacher A) level of satisfaction with the incorporation of FC in ESP classes, their evaluation of the students' engagement in the learning process, and the employed assessment techniques. The teachers' attitudes towards students' motivation and readiness to study English were also discussed along with the

challenges students face with the English language and the main factors contributing to these difficulties.

The types of the questions used during the interviews were as follows: Open-ended questions provided detailed answers; closed-ended questions offered limited and specific response from a set of options given by the researcher; direct questions, having a very direct formula, asked for explicit information from the respondent like their preferences or attitudes; and indirect questions making the questions more polite were used in this study interviews. They were expressed in the form of a statement or incorporated within a sentence. Examples of these can be 'We were wondering if there was a specific cause for something?' instead of 'Why did something happen?'; 'We were curious about whether you could provide more explanations about something?' instead of 'Can you provide more explanations about something?'

4.1.5.3..2. During Intervention Data Collection Tools

Ethnographic tools appeared as the most suitable for this study due to the need for collecting data about the common patterns of behaviours, language, and actions of oil drilling students in their ESP classes. They generally involve observations and interviews (Creswell & Creswell, 2018).

Classroom Observation

According to Babbie (2009), people can "know things through direct experience, primarily through observation" (p. 5). Weir and Roberts (1994) consider observation as an exclusive means of obtaining firsthand information about the classroom behaviour of both teachers and learners (as cited in Assassi, 2021). It is also very commonly used in studies linked to people's behaviour as it occurred in its natural setting.

Classroom observation was found appropriate for our research as it revealed aspects that may not be accessed via alternative research instruments such as learners' motivation,

feelings and engagement. In other words, it was used on occasions where the research respondents could not provide verbal reports or descriptions to their behaviours. It was used to measure the frequency rate of occurrence or quality of observed criteria. Moreover, the researchers analysed and made judgments on the collected data.

According to Muijs (2004), "subjectivity and bias can be a problem both in writing down observations and in coding them" (p. 55). To avoid that, a systematically planned observation grid or checklist (Appendix J) was depended on to be a reference for data to be coded and quantified using content analysis. It was designed based on previous models, reviewed literature and FC framework basics. It also relied on the cognitive levels of Bloom's revised taxonomy to categorize the learning activities and objectives.

The current classroom observation checklist encompassed the main features and learning practices of FCM. Both regular as well as special ESP classes were observed by the researchers and checked these main elements: Warm up components, teacher's expertise, teacher-students interaction during in-class and post-class phases, general classroom practices, learning activities, students' performance matched to the 21st century skills (engagement, motivation, digital literacy, communication, collaboration, etc), students' language production types, and criteria for the effectiveness of the lessons.

Through using classroom observation methodology, a particular attention was also paid to the significant actions and issues arising after the adoption of flipped classroom. The researchers kept a field log where detailed information were recorded or transcribed in a descriptive and reflective way. Information was collected about observable behaviours of the participants, mainly students' engagement, motivation, communication and collaboration while generating, sharing and presenting content or performing tasks as well teacher's interactions.

Classroom observation was done through taking notes and marking the noticed criteria

('0' for not observed, '1' somewhat or sometimes true, or '2' for often or very true) about the involvement and engagement of the learners, Teacher Talking Time versus Student Talking Time, the type of interaction taking place, etc. These observations extended beyond face-to-face sessions, to cover the online part of the implemented educational approach taking place before or after ESP class. It lasted for 4 sessions (1 before and 3 during implementing the intervention). For each session, the time, date and location of those field notes were recorded.

The findings of this research instrument were used along with the major data obtained from the study. In addition, the inquirers recorded the activities at the research site during the conventional as well as flipped sessions and then compared and contrasted the findings of both to measure the degree of the new teaching method effectiveness. As precaution to not affect the session's normal course, the researchers worked to not be seen as intruders.

A conscious effort was made by the researcher to avoid subjectivity and bias through maintaining a commitment to accuracy and neutrality. No interference to disrupt or change the course of the events on behalf of the researchers was expected. In addition, the participants' anonymity was guaranteed. Efforts were also made to minimize the influence of external factors.

Students' Responses to Pre- and Post-Class Assignments

The students were asked to perform assignments before each class to confirm that they had accessed the digital content related to English for Oil Drilling using Google Forms. The researcher, in collaboration with ESP teachers, designed the assignments and created a Google Forms link to be sent via the participants' email addresses, including watching videos. That authentic content was followed by assignments consisting of tasks with some questions (e.g. quizzes) before the in-person class (Appendix G). These types of tasks were based on the perspective of Roehling (2018), indicating that "quizzes and guided reading questions are the most common incentives for completing pre-class assignments" (p. 5). Having completed

the tasks, the learners clicked on ‘submit’ icon and their answers were immediately transmitted to the already created Spreadsheet to be analysed later by the researchers (Appendix I).

Moreover, the participants got the idea that the class time would be dedicated to have deeper practice related to course content in order to build up their knowledge. It was also made clear for them that their contact with their ESP instructor and classmates would be continuous after the in-class phase where they could ask questions, discuss, explain and/ or share content, etc via the created messenger group.

These fundamental concepts of FC were explained to the participants during the first session which was in-person since all coming official sessions would be entirely online, except for those scheduled to implement our designed FC course.

The analysis of the whole process was achieved through the evaluation of the learners’ involvement level with the educational materials and learning activities. It also intended for the level of developing skills by learners such as problem solving, cooperation or peer discussion, technological literacy, presentation ability, content generation creativity, etc. Further, it addressed the evaluation of students’ knowledge and understanding of the content of their field of study.

4.1.5.4. Validation of the Research Tools

The validation of the NA questionnaire, teacher interviews, classroom observation checklist, the post-study questionnaire and the suggested FC ESP course was achieved by the supervisor as an expert in English language teaching and education to guarantee their validity.

4.1.5.5. Research Practicality and Procedures

4.1.5.5..1. Pre-Flipped Course Environment

The researchers made a visit to Hydrocarbons Faculty during the academic year 2023-2024. They made a request of obtaining permission to carry out a study with oil drilling

students. After getting head of department's approval, the ESP teacher was also contacted and expressed the consent and showed readiness to be part of the study.

The students on the other hand were familiarized with the study objectives by the ESP teacher. Instructions of what tasks and actions expected from them along with the tools of communication to be employed were clearly explained by this teacher. Moreover, the researcher's role was to make sure that the implementation of the new teaching approach went as smoothly as possible and that the participants felt at ease throughout this study.

Over the analysis of Drilling and Mechanics of Oil Fields Department timetable for the 2023-2024 academic year, details about the classes and activities scheduled for Master 1 students divided over the days of the week. It planned the seminars and tutorials of specific subject matters taking place each day, along with their start and end times. It also presented the names of the modules directly related to the content of oil drilling field of study such as numerical analysis, material resistance, horizontal drilling, and equipment testing as well as some general courses like technical English.

During sessions, Master-1 students engaged in listening to lectures, made oral presentations, took notes and made lecture summaries to describe working mechanisms of oil fields machines and materials. Two written exams were scheduled by the end of each semester for all subject matters, except for English which had only one exam as it was considered of a minor status semestrial cross-disciplinary academic module.

Concerning the session of English, the faculty was intended to be English-medium based on the Ministry of Higher Education's decision. The session of ESP was taken fully online for the academic year 2023-2024 via Google Meet once a week in one and was taught one hour and half. For our study to be conducted, exceptional sessions were scheduled by the administration to implement this new educational approach.

Because English was originally taught as a translation of mere technical terms within specialized texts, the emphasis of instruction was primarily on teaching vocabulary and language structures and the broader aspects of language learning did not receive sufficient attention. In other words, language was seen as a set of isolated elements to be memorized and applied mechanically, rather than being a communicative tool. The status of English at this faculty was identical to what Boudersa (2018) described as a subject of secondary importance with a 1-coefficient and syllabus that lacked customization and up-to-datedness according to students' needs.

4.1.5.5..2. During Flipped Course Implementation

The researchers conducted a needs analysis questionnaire with the oil drilling students who approved to take part in the research. It was sent to the study participants via the email addresses collected from students who regularly attended the English language sessions. Building upon its results, an ESP course was designed following the three stages of FCM. Collecting the emails of the students or creating a messenger group was necessary since the instructor was supposed to remain in touch with the learners and contact them before and after ESP sessions.

The course was taken during the first term of the university year 2023- 2024 at Hydrocarbons Faculty, University of Ouargla. It was intended for postgraduate students of oil drilling. It aimed at developing their English proficiency along with a set of vital skills in their discipline.

The intervention comprised lessons designed upon the guidelines of the FCM. During the pre-class phase, the ESP instructor sent a link of a particular task or tasks via their emails to be performed by the learners. Learners gained enough time to watch the learning videos or see the received content, take notes, answer quizzes, perform tasks, write down questions,

understand and discuss the received content with the ESP teachers and classmates, etc, but most importantly to foster their cooperative, autonomous and self-learning.

When being in-session during the physical class, learners spent their time in doing group tasks, more practice, solving-problem situations, whole class discussions, etc. The learners were allowed to ask questions or to discuss any notes they had taken in the pre-session phase. There would be no presentation of the lessons or of their main components (e.g. vocabulary and concepts). Students were immediately involved in problem-solving situations such as discussions of what they had already prepared before session.

In the meanwhile, teachers tried to make better use of time through organizing the sessions' interactions and providing guidance to facilitate the learning process. Classroom observations were conducted to check the presence or absence of any of the prepared criteria on the checklist related to FCM.

The last stage in this framework consisted of follow-up discussions, comments, asking and answering questions, sharing content, etc of issues related to the in-class phase. Both pre and post class stages were evaluated by the researcher in the sense of learners' engagement and participation.

In order to implement this intervention, special ESP sessions were scheduled over a request to the head of Drilling and Mechanics of Oil Fields. The latter announced them for the learners on the departments' Facebook page. This procedure was brought about by the impossibility of implementing the physical part of the current teaching model since the whole sessions of English were fully taken online. This means, that this interdisciplinary subject matter was placed in a secondary rank compared to the principal modules of the learners' specialty. It has an interdisciplinary content and encouraged learners to make connections between their knowledge in the field of study and the different contexts they may confront.

The most significant element characterizing this study was the real collaboration between language teacher and discipline experts. The official ESP practitioner provided opinions related to the content of the course and validated it. Additionally, this teacher assumed the role of presenting the online sections of the course. On the other hand, the volunteer teacher presented the in-class content of the course prepared by the researchers.

4.1.5.5..3. Post-Study Research Procedures

As the pre-post research design was adopted in this research, it was recommended to conduct the whole study in a relatively short period, with administering post-study tools immediately after the designed intervention completion (Geldhof et al., 2018). Teacher B was interviewed to evaluate the implementation of FCM in the target department. In addition, the post-study student questionnaire was conducted online via Google Forms platform.

By the end of the study, the researcher extended heartfelt appreciation to the students and their teachers for their valuable time and collaborative efforts. She also showed deep appreciation for the target department personnel mainly the head of the department, for their unwavering support encouragement throughout the study conduct and their care for the success the research.

4.1.6. Data analysis

This study opted for conducting a mixed-methods research with a combination of descriptive, exploratory and explanatory methods for a more comprehensive and in-depth understanding of the impact FCM had on an ESP course design and delivery along with the establishment of any relationship between the application of this type of blended learning approach and the enhancement of ESP teaching.

4.1.6.1. Research Methods

4.1.6.2.1. Descriptive Method

In Priya's (2021) perspective, the descriptive method aims at describing a specific phenomenon in detail in its authentic context. Hancock and Algozzine (2006) contend that "descriptive designs attempt to present a complete description of a phenomenon within its context" (p. 33). McNeill and Chapman (2005) state that "it aims to answer questions like 'how many?' and 'who?' and 'what is happening?'" (McNeill & Chapman, 2005). In the current case, we opted for the descriptive research method to depict the application as well as the impact of FC on the teaching-learning procedures and attitudes towards its adoption as a permanent educational approach in Department of Drilling and Mechanics of Oil Fields. Those data were obtained from observations, content analysis of existing documents and interviews.

Similarly, Johnson and Christensen (2017) believe that "the primary purpose of descriptive research is to provide an accurate description or picture of the status or characteristics of a situation or phenomenon" (p. 847). To explain further, we used this method to give an overview about the research environment and individuals in the way they already existed through observations and portrayals of the variables, the study's selected participants and setting without application of FC intervention during the pre-study stage. Beyond that, its occurrence in the natural context intended to reduce bias and any other ethical problems.

With regard to the nature of our research, "case study research is richly descriptive, because it is grounded in deep and varied sources of information...that bring to life the complexity of the many variables inherent in the phenomenon being studied" (Hancock & Algozzine, 2006, p. 16). Stated in another way, it depends on diverse sources of data. In the context of our investigation, the researcher visited the faculty of Oil Drilling at Kasdi Merbah

University and provided accurate details about the English classes and the adopted teaching approaches there in the aftermath of Covid-19 emergence via interviewing the ESP teachers of Master 1 class. The inquirer also gathered information pertaining to the behaviours and interactions exhibited by the learners and their teacher in conventional English sessions. Moreover, an analysis of the content of the syllabus provided by the department was conducted.

Another point to consider in the descriptive method is that "the focus is not on ferreting out [uncovering] cause-and-effect relationships" (Johnson & Christensen, 2017, p. 847). In this vein, systematically observing, recording and reporting any behaviours, practices, or processes leading to the research context serve as a valuable basis for more comprehensive inquiries (Singh, 2023). McNeill and Chapman (2005) affirm that "any explanation requires description, and it is difficult, or perhaps impossible, to describe something without at the same time explaining it" (p. 8). These researchers offer a preliminary valuable background that guides and forms a subsequent research project.

4.1.6.2.2. Exploratory Method

On the insights of the description of the participants, the setting and the objectives of the study, the researcher ended up assessing learners' needs and attitudes towards the incorporation of digital technologies and modern blended educational approaches in the ESP classes via conducting an initial data investigation which was a Needs Analysis questionnaire. The latter helped at exploring the participants' perspectives, experiences and ideas related to ESP effective teaching methods.

The adoption of exploratory approach to study the effectiveness of implementing FCM in science and technology university disciplines was done "with the intention of 'exploring' or

identifying fresh research questions which can be used in subsequent research studies in an extensive way" (Priya, 2021, p. 96).

Out of using the exploratory method, the researcher also attempted to discover any patterns, insights or relations lying between the application of modern teaching approaches and the outcomes of designing and teaching an ESP course with Master 1 students as adult learners in the Oil Drilling Department such as changes in their motivation, engagement, performance, etc. Through this feature, the researcher formulated hypotheses expecting the existence of links between the variables building upon the obtained data.

Per Johnson and Christensen's (2017) assertion, the exploratory method "emphasizes starting with particular data and observations and discovering what is occurring more generally (i.e., movement from data to patterns to theory)" (p. 79). Within our research, we moved from the data provided by the descriptive approach to design and teach a new Oil Drilling course following the FC guidelines, tracking the proceedings both in face-to-face or in virtual communications and interactions, and finally building post study research tools to address and gather data about the identified areas and practices matched to the implemented intervention.

4.1.6.2.3. Explanatory Research

In addition to the descriptive and exploratory methods, the current study employed the explanatory research method as there were some already existing general ideas and data about the implementation of FCM and its principles, i.e., we departed from already existing knowledge as the problem under investigation was not unprecedented. Besides, explanatory case study sought to identify any cause-and-effect links and to determine the factors contributing to particular results (Hancock & Algozzine, 2006). To be more precise, its purpose was to explain the impact of the flipped instructional model as an independent

variable on oil drilling course as a dependent variable within the context of Ouargla University.

Furthermore, the inquirer would "explain how and why a phenomenon operates as it does" (Pedhazur, 1997) regarding the data gained from conducting observations. Further, the study explained the potential reasons behind any cause-effect relationship between FCM and its effectiveness of ESP science and technology classes through the analysis of data gathered from the implementation of the FC intervention and comparison of the pre and post study collected data. This research was also an attempt to identify any factors affecting the research findings and implications.

This explanation was supported by justifications and evidence compiled from administering diverse data collection tools with students and experts in the field. The explanatory design aimed to provide valuable insights for future decision-making and potential recommendations for the enhancement of ESP teaching in the digital age.

4.1.6.2. Coding and Data Analysis Tools

Motlhabane (2017) depicts coding as a process where the collected information were organized and categorized under fundamental labels or codes. It is employed to ensure accurate interpretation. According to Creswell (2009), coding entails taking text or visual data gathered during data collection, segmenting their units into categories, and naming them to denote the identified labels. Moreover, he suggests the coming coding scheme for qualitative data, notably interviews and classroom observations in the current study:

- first, gaining a comprehensive understanding of the given set of information through getting familiarized to the collected data;
- second, conducting a focused and analytical approach to understanding the data in hands;

- third, organizing and categorizing the collected ideas from the participants, creating a list of all the topics that have emerged and grouping together similar and overlapping ideas into major topics;
- Fourth, abbreviating those topics into codes, writing them next to each segment to identify any new emerging categories and codes. These codes can be assigned to individual words, phrases, sentences, or even entire paragraphs such as 'FCM' for 'Flipped Classroom Model' and "AC" for "Active Learning" to avoid repeating the whole segment each time we find it;
- The fifth step includes turning the topics (more general concepts or themes that emerge from the data) into categories (more specific providing more detailed level of data analysis and represent sub-themes or sub-concepts within the broader topics). In other words, in this level, topics were further sub-divided into more precise themes;
- sixth, organizing the codes;
- the seventh procedure involves grouping the data of each category into one place and conducting an elementary analysis; and finally, considering any recoding of the retrieved or available data.

Regarding teacher interviews, the obtained answers were transformed into transcripts. Next, they were carefully analyzed to identify relevant themes and topics related to the teacher's perspectives and experiences and to provide recommendations about the implementation and effectiveness of this teaching approach in designing and teaching oil drilling course in the target context. By grouping the interview responses into organized thematic categories, the researcher was coding data to facilitate deeper analysis and interpretation with the aim of revealing the main concepts, issues, and findings that the study uncovered through the interview data collection.

Concerning the classroom observation, the recorded behaviours and interactions were assigned appropriate labels or codes, corresponding to the appropriate category in the observation checklist. Observed patterns, trends, or frequencies of learners' and teachers' performance were examined to identify connections and perceptions from the data. The aim of this process was to understand and improve the educational practices in the digital age and to shed the light on probable emerging topics for further research.

In the current study, it was found that arranging qualitative data (interviews and classroom observations) under major themes was predetermined prior to the analysis, except for the open-ended questions which let the door open for any unexpected themes. Thus, content analysis was conducted through examining the written transcripts and entailed quantifying and creating categories within the defined themes with the aim of drawing any valuable conclusions.

Similarly, the data entry of the coded responses was transferred from Google Forms questionnaires' responses to be collected in a Google spreadsheet. Google Forms automatically calculated the frequencies of the questionnaires' responses and generated visual representations (bar charts, pie charts, line graphs, etc). Once the data was ready, further analysis and organization were conducted.

The analysis of the data gained from the questionnaires was deliberately performed via Google Forms for a set of reasons. First, it is manageable and smooth in manipulating and analysing data. Second, it automatically transfers the responses into a spreadsheet. Third, it shows the responses number and percentages for each question option. Lastly, it shows visualized presentation of data in graphs, charts, etc.

Student Needs Analysis

The needs analysis questionnaire was divided into six major sections or themes. The first part contained general questions about the participants' demographic background (age

and gender). The second one discussed their learning experiences and attitudes towards acquiring English language (proficiency level; English use; main goals of learning English; importance of English proficiency in their studies; efficient approaches to learning English; students' attitudes towards English language learning; English learning experience prior to enrolling in Master's). The third section tackled learners' difficulties related to the 4 skills (problems facing them in learning each of those skills; views related to the major factor to improve their level in English). The fourth part dealt with learners' criteria for a good lesson. The fifth section described learners' preferred classroom activities types along with the essential skills to be integrated in English classroom (summarizing, discussion, oral presentations, taking notes, searching for specific ideas and information, comparing, etc). Section six portrayed students' experience with online education before, during and after the spread of Covid 19 pandemic and the main problems they had faced (Internet access and availability, technological literacy skills, etc).

Student Post-Study Questionnaire

After implementing FC intervention, a questionnaire was designed aiming at collecting data about the views and attitudes of the students towards this modern teaching approach along with the difficulties they faced during the course. Necessary recommendations and modifications would be made to the course content, design and selected materials based on the findings of this questionnaire along with other post-study research tools.

The study's central emphasis was a multifaceted investigation of the ESP learning experience in the digital age. Key themes encompassed students' satisfaction with the course content and topics, as well as the crucial role that technology and digital resources played in improving the ESP learning process. The addressed pivotal aspects ranged from technology access and user readiness, to students' preparedness, engagement and motivation levels. Researchers also delved into learners' overall experiences, including the support provided by

ESP practitioners and the classroom environment. Additionally, the examination included students' experiences with FCM, analyzing feedback on both the in-class and online assignments, activities and general learning atmosphere. Lastly, the study sought to gain an in-depth understanding of the skills and competencies developed by learners during the implemented course.

ESP Teacher Pre-Study Interview

The ESP teacher pre-study interview was designed to gather insights from the English teachers regarding their experiences and practices in teaching ESP in the Department of Drilling and Mechanics of Oil Fields, particularly in the digital context. It gathered details about the ESP teachers' profile (age, gender, employment status, teaching approach). It placed a significant focus on exploring the integration of technological and digital resources in English instruction, as well as teachers' attitudes towards their students' preparation, readiness, and motivation for learning English. It also investigated the designed course's balance of English language and students' specialized content, types of materials, learning activities, assessment methods used along with the teachers' language of instruction (native language vs. English).

Moreover, it delved into the teachers' prior experiences with the adoption of innovative teaching modalities like blended learning and FCM, their perspectives on the challenges faced by students in learning English, and a self-evaluation of technological skills. This interview tried to elicit detailed feedback from the teachers of English on their experiences, practices, and perspectives regarding effective ESP instruction, particularly in the context of technology-enabled and student-centered approaches in the Department of Drilling and Mechanics of Oil Fields.

ESP Teacher Post-Study Interview

The current post-study interview targeted at oil drilling English teachers addressed key

themes related to putting the designed course, based on the FC framework, into practice and evaluating its effectiveness in oil drilling classes. It examined students' preparation, engagement and instructional challenges, mainly the language difficulties faced by students (vocabulary, grammar, pronunciation, fluency, etc.) as well as the challenges in implementing FCM. It also shed the light on teachers' attitudes towards adopting alternative web-based teaching approaches, FCM's perceived impact on students' improvement and the effectiveness of the English course, the challenges in managing student interactions and behaviours and the reasons for lack of student presence and participation in online as well as face-to-face sessions.

Additionally, the interview sought to gain any remarked changes in learners' expectations, motivation, and attitudes towards ESP learning experience. A significant focus was placed on the role of technology and digital resources in facilitating ESP instruction. The interview further tackled issues faced during the implementation of this approach such as resistance to change, instructor training and preparation, and the time-consuming nature of course design and content development, technology access and availability and other various obstacles making FC incorporation difficult in the Department of Drilling and Mechanics of Oil Fields..

The fundamental goal of this interview was to gather comprehensive feedback and insights from ESP teachers in search of using more efficient alternative teaching methods to do away with the flaws of the conventional ones in English language instruction and to enhance the ESP practice.

Content Analysis of the Department of Drilling and Mechanics of Oil Fields Syllabus

For in-depth details about the already-existing English course, ethnographic methods were employed. Through content analysis, the researchers tried to provide valuable insights into the already existing content of oil drilling lectures before designing a new course using

FC.

The purpose of the syllabus provided by the Department of Drilling and Mechanics of Oil Fields was to offer the ESP teacher an outline of the topics to be developed and covered throughout the semester. It was an attempt to guide them to plan the lessons' content to be covered in each class session. It was also the starting point to design and develop a course using the FCM in this study.

The document included the following components: Field of study (oil drilling), type of the content (general culture), semester (I), type of the course (Technical English), fundamental objectives of the course (developing the student's knowledge of technical English for the drilling domain; improving their ability to understand written English materials related to the field; preparing them to effectively utilize English-language resources and documentation within a drilling company or similar workplace), prerequisites of the module (Bachelor's-level skills), titles of chapters, assessment methods and name of the instructor.

Additionally, the syllabus was divided into two main chapters: The first on dealing with processing and comprehension of scientific texts; the second addressing the translation of that specialized content. Each of these chapters covered a range of related subtopics. In general, this syllabus outlined an overview of the topics that were covered by the course in a chronological order in the context of a Master's program in oil drilling. That set of themes was identified out of that analysis. They commonly appeared in tables of contents of the famous books and workbooks in the field of hydrocarbons.

On another side, all titles along with the statement of the objectives were presented in French while the detailed content was in English. The adoption of such bilingual approach in introducing the information reflected the dominant multilingual requirements in the administration of the Faculty of Hydrocarbons.

Further, the teaching approach of ESP mirrored in the already-existing syllabus seemed to be a blend of genre-based and translation-oriented approaches. That is, the original ESP course aimed to develop students' skills in reading comprehension, text analysis, and translation to effectively engage with scientific and technical English in the context of the hydrocarbon field.

4.1.7. Validity and Reliability of Research Findings

An important part of social science research is the quantification of human behaviour (Drost, 2011). In this study, we tried to measure the attitudes of the Algerian university teachers and students towards the adoption of FCM as an educational approach and the extent to which their educational performance was enhanced. To reach that end, the research tools and tests had to be valid, reliable and practical enough to guarantee the accuracy and credibility of the study findings.

4.1.7.1. Research Validity

Validity is concerned with the meaningfulness of research components (Drost, 2011). In the view of Priya (2021), external validity emphasizes the issue of determining whether the findings of a study can be generalized to other instances. On the other hand, internal validity is concerned with minimizing the influence of unwanted or extraneous factors.

Creswell (2009) recommends the use of many strategies for the assessment of the findings accuracy and being successful at convincing the target audience of the credibility of the procedures and findings. We opted for the following procedures to enhance the validity of mainly the qualitative part of the study:

- First, a detailed description of the study procedures, objectives and reflecting the participants' attitudes towards the modern teaching approaches. This technique aimed at conveying the richness and realism of the results.
- The second strategy we adopted was the derivation of evidence from the triangulation of

different data sources. The latter was opted for integrating the qualitative data obtained from conducting pre-study teachers' interview and the ethnographic description of the setting.

- The third technique was the clarification of the investigator's bias to the study and effect on the interpretation of the findings out of her personal experience as a middle school teacher and a Master student who witnessed teaching and learning methods and procedures during Covid-19 pandemic spread. The bias also emerged while discussing the reasons for the lack of learners' engagement during the online pre-class phase of FC.
- Another strategy was based on the reflection of the emergence of any contradictory data or perspectives; this would acknowledge the diversity of the viewpoints and perspectives of the real-life situations, and hence, the credibility of the research account would be enhanced.
- An additional plan to evolve the credibility of the study, proposed by Creswell (2009) and adopted by the researcher was allocating an extended duration in the fieldwork and observations. This tactic intended for fostering an in-depth understanding of the conformity of the study actual setting, the interactions of participants in that natural environment, and the reality of ESP teaching in the Algerian universities via the application of the modern digital teaching approaches.
- An extra strategy suggested by Creswell (2009) was peer debriefing. This was done via the role of the supervisor who reviewed the work, led discussions, asked questions and suggested modifications.

Cohen et al. (2018) claimed that the quantitative and qualitative data combination intensifies the research validity concerning the rigour of its design and suitability to the target objectives and questions, findings consistency with the given evidence and the data summary quality. In Creswell's (2009) perspective, the triangulation of data involves collecting data

from multiple sources such as interviews, observations and analysis of documents. Therefore, triangulation of research tools was a significant plan in this action research study that aimed at maximizing the credibility of the findings of the research.

Cohen et al. (2018) affirmed that “unreliable tests or instruments can introduce serious errors into research”. In an effort to achieve internal validity, experts in the field were asked whether the chosen research tools and design were suitable to depict any causal relationship between ESP courses quality and the implementation of FC. These experts’ opinion is also necessary for the decision about the pre- and post-study appropriateness to the students’ level and major on one hand and to the study’s questions and objectives on the other.

Those experts’ validation of the research tools guaranteed content validity. In other words, they depict the extent to which those instruments adequately addressed and measured all the aspects to be covered by the study.

The interview questions were based on those experts’ comments and suggestions along with the literature review related to the topic. The classroom observation was done respecting a checklist containing a set of participants’ behaviours and interactions such as learners’ academic achievement, cooperation, communication, engagement, and motivation along with notes taking. Those items were developed from reviewing checklists previously set by experts in the field. Another issue that can allow the interference of extraneous factors is the long interval between the pretest and posttest in this action research resulting in doubtful scores. In addition, the testing itself can raise the participants’ awareness to the significance of shifting into modern methods of foreign language learning. To prevent any serious errors, the researcher plans the course of the study in the shortest period possible.

Another way to assess the study internal validity is through piloting its procedures. Teijlingen and Hundley (2001) define it as “The term 'pilot studies' refers to mini versions of a full-scale study (also called 'feasibility' studies), as well as the specific pre-testing of a

particular research instrument such as a questionnaire or interview schedule" (2001). Chiang et al. confirmed that "[It is] conducted to make sure that a new procedure works as planned"(2015). The needs analysis questionnaire was translated into Arabic and piloted online on a small group of volunteering students from the target population to give feedback about their understanding of FCM, the clarity and appropriateness of questions language and structures, etc.

After this step, the researcher eliminated, modified, refined or rephrased any difficult, ambiguous and unnecessary items. The researcher tried to assess the construct validity of this study by comparing the findings of the pretest-posttest questionnaires to those of the interview and classroom observation and supporting them by each other if there was no contradiction in their results. Moreover, the teachers' and students' already experienced Covid-19 conditions were invested to assess the generalizability of adopting technology-based education- FCM in our case- and moving from being the only existing option for the Algerian universities education to carry on and become a tool to improve teaching-learning practice and performance. Consequently, the external validity can be guaranteed.

4.1.7.2. Research Reliability

According to Creswell (2009), reliability means investigating the stability or consistency of results. About the importance of reliability, Kothari (2004) affirms that the appropriate design reduces bias and increases the trustworthiness of the data. Volchok (2015) affirms that reliability is about ensuring that an experiment, test, or measurement procedure produces stable and error-free results when repeated under similar conditions.

To avoid any sort of randomness and unreliability in this study results, the data collection tools were as detailed as possible to cover enough items related to the objectives, components, procedures and conditions of the FCM intervention, participants and any future implications and recommendations and its correlation to the ESP variable.

In addition, the research tools administration conditions were taken into consideration. The pre and post study questionnaires were sent to the learners' emails to be replied at the time that suited them within the time frame of the study. So, there was no need to the test-retest reliability as their readiness to take the tests can ensure their responses stability. The teacher interview was conducted when the ESP teacher showed willingness to cooperate with the researcher within the limited time of the study. The classroom observation conditions were normalized as much as possible to eliminate the interference or influence of any extraneous factors such as the unfamiliarity of the courses setting.

For the qualitative research approaches, Yin (2003) claim that it is necessary to document as many procedures of the case studies as possible to ensure their reliability or consistency (as cited in Creswell, 2009). To sum up, validity ensures the accuracy and meaningfulness of the research findings whereas reliability relates to the uniformity and reproducibility of the quantitative data or observations gathered from a research (Singh, 2023).

4.1.8. Ethical Issues and Practices

With the intention of ensuring that the current action research applied scientific research ethical guidelines, the researchers initially sought and obtained the permission of the department head to conduct the study in the Department of Drilling and Mechanics of Oil Fields before the beginning of the study.

Second, Master 1 students and their ESP teachers granted their consent to collaborate with the researchers. Asking for the learners' confirmation of participation was introduced as a section in the student online questionnaires (Appendices E, K, and L) and was expressed verbally by the ESP teachers before initiating the interviews (Appendices D, M). The respondents were informed of the study procedures and goals. Their contribution was totally voluntary, anonymous and free of any pressure or risks. These procedures were set out to

ensure that participants respond comfortably and honestly without worry of any judgments. The study subjects were left at ease taking their time to respond the questionnaires. However, they received a request to answer them as soon as possible. Above all, the inquirer tried to guarantee respondents' anonymity by not collecting any personally identifying information mainly email addresses or show their identities in screenshots of examples of their contributions which were included in the appendix section.

On their part, the researchers committed to utilizing the supplied data exclusively for the sake of academic purposes. In addition, the questionnaires were translated into Arabic as learners' native language. This step assisted at guaranteeing equal access and fairness to all students through fully understanding the questions regardless of students' proficiency level in English. Removing language barriers also enhanced the validity of the collected data through enabling learners' to provide accurate and complete responses.

The departments' authorization, seeking participants' informed consent, explaining clearly the purpose of the collected data use, and translating the research tools (Appendix L) were an attempt by the researchers to guarantee ethical integrity and ensure confidentiality considerations.

4.1.9. Limitations and Delimitations of the Study

As any other research, some constraining factors arose during the course of the study although we attempted to overcome or reduce their impact on the research findings or design. It was our duty to "describe the potential limitation, explain the implication of the limitation, provide possible alternative approaches, and describe steps taken to mitigate the limitation" (Ross & Bibler Zaidi, 2019, p. 261). Accordingly, presenting those limitations guarantees transparency and integrity of the researchers and research and "the results are not distorted and misinterpreted by the wider readership" (Theofanidis & Fountouki, 2019, p. 156).

On the other hand, some boundaries or limits of the research were set by the researchers so that its objectives become possible to achieve (Theofanidis & Fountouki, 2019), its scope is restricted and its editors and reviewers understand any methodological issues (Ross & Bibler Zaidi, 2019). These are called study delimitations which "are not as much as "why I did this" but rather "why I did not do it like this" (Theofanidis & Fountouki, 2019, p. 156). Moreover, they "involve conscious exclusionary and inclusionary decisions made during the development of the study plan, which may represent a systematic bias intentionally introduced into the study design or instrument by the researcher" (Ross & Bibler Zaidi, 2019).

In the coming lines, both our research's limitations and scope were presented in parallel. We limited our study to Matser-1 students as they were the oldest cohort in the target department who study English subject, meeting the principles of adult learners emphasized by the ESP approach and flipped classroom model. The first limitation emerged from the lack of information collected about the English sessions in the Department of Drilling and Mechanics Oil Fields leading to postponing the implementation of the designed course to 2023-2024 academic year. Instances of such problems, the researcher was not notified that English language coursework for this cohort of students was limited exclusively to the first semester for MA-1 and totally absent in MA2. In addition, the clerk stationed in the student issues office stated that the subscription period would take longer period. Unfortunately, the subsequent researcher's visit to the target department was delayed until those administrative procedures would be comprehensively addressed and then it was too late for conducting the study with this Master 1 cohort.

As an interdisciplinary secondary module, ESP was scheduled to be fully instructed online. This procedure generally began to be adopted in the Algerian universities with the emergence of Covid-19 pandemic and the safety procedures accompanying it. This stood in

contrast with the conventional in-person approaches opted for during the previous years.So, the researcher-in coordination with the supervisor- was obliged to program special face-to-face sessions within the timeframe of the first semester in order to apply the designed ESP course. Furthermore, the study duration was minimised, complying to the nature of ESP as a semestrial module for MA-1 students in the target department while studies did not start early.

The pre-post type of quasi-experimental research design used in this study is considered among the relatively weaker methodological frameworks. The results from this study may have limited generalizability due to the lack of sample' representativeness of the research population compared to the experimental design (Morgan et al., 2000). In addition, the researchers were constrained by the practical impossibility of randomly assigning participants into experimental and control groups, requiring the resort to the use of this quasi-experimental approach. To reduce its effect, some measures were opted for- as previously stated- such as employing a mixed-methods approach and providing a detailed description of the research procedures and limitations.

The majority of qualitative methodologies are impossible to be replicated compared to controlled experimental designs and would hinder direct verification of the findings (Theofanidis & Fountouki, 2019). So, detailed description of the interviews' and classroom observations' procedures, themes, coding techniques, and analysis methods would help the readers in understanding the methodological thoroughness and context that surrounded the qualitative data collection and interpretation.

One more challenge was the small sample size. The potential reason for such situation was due to the hardness to access the target population and engaging them in the study because of the regular absenteeism of the majority of the students during the ESP session. This prevented the researcher from applying FC to all students. As a precaution, we had opted

for the purposeful sampling technique and targeted only the students who had the tendency to attend the English session.

Low response rates when answering the online questionnaires via emails limited the representativeness and generalizability of the findings to the selected sample. To lessen the impact of this factor, the resolution was adopting diverse strategies to ensure learners' engagement, notably creating a messenger group on facebook supported the originally used technique of sending content to the selected sample's email addresses.

A further restriction was the lack of motivation in providing responses for the post study questionnaire. To fix this problem, the ESP teacher suggested providing incentives including extra marks for the respondents. This was implemented within the limits of the ethical guidelines of preserving participants' decision-making and freedom in expressing their opinions without being influenced by the researcher' attitudes or position and, hence, preserving the credibility of the research process.

Section 2: Description of the Designed Flipped Classroom English Course for Oil Drilling

4.2.1. Background to the Designed Course

Through tackling the background to the designed course, we sought to cover the contextual details including the rationale, justification, and designing framework for developing the flipped oil drilling course at Kasdi Merbah University. It shed the light on this course's designing and offering cause, the needs and gaps it addressed (preparation of students for communication using discipline-specific language, provision of more specialized language training meeting the requirements of the job market, etc). Moreover, The FC model was employed as a framework to structure and deliver the suggested ESP course.

As set by the Center for Teaching Excellence, there must be certain balance, logic, and a tight coherence among the course's topics, objectives, organization, instructional strategies, learning tasks and assessment techniques.

4.2.2. Validation of the Designed Course

The designed course was reviewed by the ESP teacher (Teacher B) and offered his opinion as a content expert in oil drilling field and the supervisor as a language expert. The evaluators agreed on the content of the course. Their suggestions were taken into consideration and modifications were applied to the designed course.

One of the models that were depended on this research to evaluate a designed course was introduced by Chan (2009). The latter uses a six-step model consisting of two parts: Part A including pedagogical issues in ESP courses which are needs analysis, learning objectives, teaching approach, authenticity of the language, contextualization of the language, and learner's autonomy; Part B tackling specific subject matter (Bocanegra-Valle, 2010)

4.2.3. Course Design for Oil Drilling Based on Selected Textbooks

The researcher depended on the following published textbooks to select the most relevant topics for the learners according to the needs analysis findings.

- Career Paths: Petroleum II is written by Virginia Evans, Jenny Dooley and Seyed Alireza Haghighat and published by Express Publishing. It is arranged into three series. It is intended for petroleum industry practitioners seeking to enhance their communication skills in workplace. The topics it covers are: jobs in petroleum industry, oil rigs types and mechanical systems, mapping of petroleum, and the process of oil drilling.
- English for Petroleum: Students' Workbook (2013) is written by Ken McIntyre and published by Centre for Language Studies in Dili Institute of Technology. Among the topics it includes are: measurement units; questions and answers structures about measurements; comparison of quantities, size, thickness, weight, leaks; in addition to texts

about international oil companies, oil production and transportation, oil refineries and pipelines.

- Oxford English for Careers: Oil and gas 2- Students' Book is intended to teach English for oil and gas students. According to its authors, it covers the necessary language, knowledge and skills needed to communicate in English in this field. The main topics it includes are: exploration and production of oil, drilling, environmental issues, safety in oil fields, oil transportation and storage and refinery processes.
- English for Oil and Gas Industry. Reader by A. O. Nosenko: The book centers on teaching technical English and enhancing comprehension skills of occupational communication in topics related to English for oil and gas industry.

4.2.4. Criteria and Rationale for the Study's Textbooks Selection

The course in this study was designed depending on their humble teaching experience and expertise and on syllabus proposed by the Department of Drilling and Mechanics of Oil Fields. The content was generated out of selecting learning activities and texts from already published textbooks in the field of hydrocarbons while organizing the lessons phases employing FCM. The researchers relied on those references as a guide and support for the ESP teachers' delivery of that course. Besides, they tried to build up an ESP course content compatible to the needs of the study participants and the target situation requirements. By implementing the designed course, learners' expectations, motivation, and attitude towards FCM and ESP course were reflected in their responses to the post study questionnaire.

The course depended heavily on already published textbooks for the following reasons:

- It provided us with the necessary confidence to rely on because of the high credibility of the materials produced by these publishing houses in addition to their popular reputation. They helped us to gain the necessary experience from them.

- Our position was that of researcher rather than course designers as we did not receive any sort of training in designing courses along with the shortage of time dedicated for the PhD preparation.
- The greatest focus was on the efficiency of the FCM and the attitudes of the Algerian ESP teachers and students towards the new teaching trends relying on the digital technologies rather than on the content of the course itself.

Concerning the reasons for selecting those textbooks, the course in oil fields was designed to put oil drilling students in situations where the language used resembled that they encountered in their field of study and oil companies in their future career. Students' communicative uses of Englishwere found in describing any procedures, mechanisms, precautions and more taking place in real oil fields, writing reports, and orally asking, answering and giving explanations of surrounding activities.

Another cause was the kind of activities in the selected materials to offer English content to students and enhancing their achievement in assignments or examinations. The tasks took into account a balanced simplicity in presenting the content without any necessity to resort to oil drilling discipline specialists to present the designed content.

4.2.5. FCM for Oil Drilling English Course Designing and Teaching Approach

Based on the results of this study's pre-intervention collected data, the main components of the syllabus prepared by the oil drilling faculty were expanded and the course was designed using Flipped Classroom design. The design followed these steps: providing the instructional material online before coming to class, allocating class time to actively and collaboratively engage students into learning activities, and finally conducting any further discussion in search for clarification or expansion of the in-class tackled content. To put it differently, this proposed course including its content, learning activities, selected instructional materials and assessment methods were organized around the principles of the

flipped classroom.

The researchers adopted FCM in designing the course in a way to have students engage with instructional materials and activities independently before class, then use class time for active, collaborative learning activities, and lastly sharing, generating, discussing or reflecting on a particular content via activating their skills of active learning (note-taking, reflection, questioning on given knowledge), critical thinking (analyzing and evaluating the value of the already received content), collaboration (sharing generated or synthesized content, or providing feedback or support).

4.2.6. Theoretical Background to the Course

The current course for oil drilling specialty was founded on commonly acknowledged theories and methods in contemporary language teaching such as cooperative learning, communicative language learning, task-based approach, project-based learning, etc. In addition, attempts of reducing interference of Arabic as study participants' mother tongue (L1) and code switching to French by acquaintance in this ESP class were taken into consideration with the aim of encouraging the target language immersion in real-world occupational and academic contexts, elevating the quality and effectiveness of communication and other skills such as promoting intercultural awareness.

4.2.7. English for Oil Drilling Course Development Using FCM

The final step in the course design process was the development of the content of the course. This course was organized into two chapters. Each one consists of a set of topics related to oil drilling industry workers, activities and operations, safety and emergencies at oil companies. They dealt with socialising in oil companies in which learners would practise expressions of introduction, greetings, and expressions of politeness along with talking about interests and jobs at the company and keeping positive relationships with crewmembers of different cultures. Other subjects tackled the types, parts, equipments, and products of oil

companies and the activities of their workers along with the modes of communication taking place at oil companies during business meetings and negotiations. The course also depicted the several stages of the process of oil industry and safety issues accompanying them encompassing environmental concerns emergencies.

4.2.8. Study's Designed and Implemented FC English for Oil Drilling Course Template

The organization of the course depended heavily on a handout entitled 'Course Design' which was employed as supplementary resource for course design workshop led by the Center for Teaching Excellence, Haas School for Business at the University of California. It was a template based on student-centered teaching. It was adopted by the researcher to be the framework for course designing and development.

The designed course was a blend of linguistic items contextualized within the content of oil drilling subject matter. In other words, learners were getting their field of study knowledge in English. All skills were having equal emphasis. Listening to and watching videos of some mechanisms and measurements in oil fields, reading texts about safety there, engaging into oral discussions and interpretation of visual representations (graphs, diagrams, etc), writing a report of oil discovery were examples of the lectures' activities taken by target learners. These contexts needed specific language forms, functions and notions such as giving instructions using the imperative form and time sequencers, locating places and giving directions employing prepositions and adverbs of place. This input was transmitted into oral and written output that was implemented later using FCM.

- **Target learners**

The current course targeted Master 1 students of oil drilling in attempt to improve their proficiency in English so that they became able to communicate effectively in their discipline as English has become a language of instruction in the Algerian universities. In

addition, an attempt was made to enhance the situation of English in the target faculty by ensuring learners' involvement with the course through adopting modern teaching methods.

The choice of such cohort was due to many reasons. First, those learners were the most suitable sample for the initial proposed doctoral project targeting adult learners and they were supposed to be more prepared for engaging in more advanced roles and responsibilities within the oil and gas industry.

Owing to this, the course would serve as a training to enhance their technical expertise and leadership skills related to oil drilling operations.

Third, they had an appropriate level of background knowledge, foundational concepts and skills acquired during the earlier stages of the program of oil drilling. So, the designed course depended on mobilizing those students' prior knowledge and experience in their discipline such as industry-specific interactive situations, equipments, instructions, procedures, etc.

Among all the preceding factors, the coming was the most significant motive for the selection of Master 1 students as a sample for implementing FCM. They were the most accessible senior group within the faculty having ESP in their educational program unlike Master 2 students.

- **Investigating Learners' Needs**

The researchers as course designers investigated the learning needs through conducting a questionnaire to oil drilling students and interviewing the ESP teachers to get information about the academic content and requirements of their discipline.

- **Investigating Specialist Discourse**

Moreover, a deep search for the suitable content for pre-session phase (text, tasks, videos, etc) was pursued either on the learning websites or already published textbooks. The selected content tried to make a balance between authenticity and appropriateness to the teaching

purposes.

The findings of the investigations of needs and specialist discourse were reflected in the designed course curriculum and content. They were based on language skills (reading, writing, listening, speaking), linguistic knowledge (grammar, lexis) and the interdisciplinary versatile skills (digital literacy, communication, problem-solving, critical thinking, collaboration, creativity, etc

• **Designed Course's Learning Objectives Alignment with Bloom's Revised Taxonomy**

The designed course for teaching English for oil drilling discipline had short and long term objectives; the first focused on immediate application and practice of language skills in authentic communicative scenarios about specific content using the digital tools while the second included lifelong learning needed in learners' future professional career and competitiveness in employment landscape.

The learning objectives were developed based on revised Bloom's Taxonomy of learning objectives. The exercises and tasks of the textbooks were built upon those different learning objectives targeting various cognitive domains and levels of complexity, ranging from basic recall to higher-order critical thinking.

- Academic Objectives

- To foster different learning skills to study effectively: engagement, cooperation, communication, critical thinking, and technological literacy.
- To identify the technical terms specific needed to communicate efficiently in English in oil drilling industry (comprehension of instructions, procedures, mechanisms, etc).
- To develop cultural awareness that influences communication within international groups.
- To enable the learners to develop accompanying skills to the learning process (taking notes, problem-solving, critical thinking, decision-making, etc).
- To enable students to produce written texts

- To enable students present data graphically and orally
- To introduce students to the basic fundamentals of professional communication and to apply them to critically analyze and translate discipline -specific texts.
- To involve students in authentic problem-solving situations and activities suiting their academic field of study and professional areas of interest.

- Occupational Objectives

- To build a general technical and engineering knowledge about oil exploration, drilling and production.
- To develop skills of teams' leadership and management techniques under different conditions in the oil and petroleum industry with a strong emphasis on safety and efficiency.
- To improve learners' English communication in the workplace.
- To demonstrate an understanding of specialist key concepts, principles and background information on the field of study.

- Cross-Disciplinary (General) Language Proficiency Objectives

In addition to the attainment of the above mentioned oil drilling specialty specific terminology and field objectives, students were in need to develop broad applicable communication requirements independent of their subject matter called 'content-neutral outcomes' by the Center for Teaching Excellence. The emphasis of these type of objectives is on developing the process (the way learners learn) rather than focusing just on the content (what they learn). They can be adapted and transferred to address future new situations for continuous improvement. These are some examples: higher order thinking skills (analysis, evaluation, synthesis, self-awareness, reading and listening comprehension self-regulatory skills (e.g. planning, organization and self-motivation), presentational skills, etc,

In a nutshell, the current course aimed to develop the necessary skills that were practical and relevant to learners' future career in the oil industry including: enriching specialized terminology; enhancing written and verbal communication in diverse scenarios related to oil industry such as safety protocols, environmental considerations and operations; cultivating their competency of analysis and comprehension of oil drilling industry reports, documents and procedures; and building the capacities required to communicate and collaborate within groups.

- **Structure of the FC Oil Drilling Course**

- Topics Arrangement in the Designed Course

This oil drilling course outlined the sequence of the covered topics, key concepts, and activities within a framework that respected the logical progression of content and skills development and created a sense of guidance for both educators and learners.

The course blended micro (e.g. through pre-class activities, videos) and macro (application and discussion of that content during physical class) levels since it was designed via FCM. It departed from building specific language skills (reading, writing, speaking, listening) and topics, and then, expanded to address broader contexts and industry-specific Knowledge or vice versa.

- Topics Sequencing in the Course Curriculum

Depending on the analysis of learners' needs along with the learning objectives of the subject matter, the topics covered by the current oil drilling course followed a sequential approach which involved logical progression of topics, where each topic was built upon the knowledge gained in earlier steps and served as a prerequisite for the next topic.

Table 11

Sequence of the Topics in the English Oil Drilling Curriculum

Chapters	Topics	Learning Objectives Aligning with Bloom's Taxonomy

Chapters	Topics	Learning Objectives Aligning with Bloom's Taxonomy
Chapter 1: Oil Industry Basics	Refinery Operations	-Understand the fundamental refinery processes of crude oil. -Demonstrate the ability to communicate technical refinery terminology in English -Analyze the advantages and disadvantages of the refining techniques.
	Oil Products and By-Products	--Compare and contrast the features of oil company products -Demonstrate the ability to measure key properties of the oil company's products
	Organization at Oil Company	- Assess professionals' self-introduction and impression management skills -Build professional relationships and rapport - Identify job categories, key roles, required qualifications aligning with specific job opportunities in oil company
	Refineries and the Environment	-Learn safety symbols and signs -Identify and recognize dangerous situations and give warnings -Describe safety rules -Give instructions and advice -Assess one' ability to report an accident -Express obligation and prohibition
	Decontamination Procedures	Design enhanced automated safe mechanisms to better protect against catastrophic events.
Chapter 2: Technical Processes and Equipment at Oil Companies	Exploration	-Describe a process -Arrange processes and procedures -Explain the visual presentations (pie chart, graphs, etc) used to represent operational and performance data in the company.
	Distillation	-Explain the purpose and significance of the key processes and procedures of the oil company's
	Refining	-Differentiate between the production processes in the oil company -Design a piece of oil drilling equipment
	Equipment: the blowout preventer	-Describe pieces of oil drilling equipment -provide details about the key features and mechanisms of the blowout preventer equipment
	Pipeline Components	List the names of the basic equipment in the oil companies
	The circulation system	Identify the basic systems for circulation operations involved in the company's production network.

- Learning Activities and Instructional Strategies

The tasks in the English oil drilling class aim to meet the different styles of learning in

Table 12

Examples of Learning Activities in FC Oil Drilling Course

Pre-class Activities	In-class activities	Post Class Activities
-Reading texts about oil industry-specific and taking an online quiz -Watching videos and summarizing their main points in diagrams or mind maps	-Quick oral quiz about the pre-class learning material -Discussing any ambiguous information addressed in pre-class phase	-Watching videos for a deeper understanding of the in-class content -Self-evaluation and reflection on personal

-Writing a summary to industry-specific reports and articles. -Listening to audio clips and taking notes	-Role-playing interviews and meetings (e.g. roles of the manager and worker) -Collaborative research -Peer teaching on oil industry-specific content -Group discussion on oil industry-specific projects -Oral presentations in front of the class -Memory games -Writing reports -Problem-solving activities	academic advancement -problem-based learning -hands-on activities - generating and sharing digital content and lectures' summaries - Discussions

order to facilitate an in-depth perception of the presented content, to develop the aligning skills to the learning process, to foster lifelong learning and personal growth of mindset. To that end, hands-on tasks, problem-solving activities and analysis of authentic texts introduced students to basic concepts of oil industry processes, systems, equipment, safety procedures, etc. As for the in-class activities of FC, Brown (2016) finds that "students report that answering questions based on the readings motivates them to read the course material, helps them under-stand the material, and allows them to be more engaged in the course discussions".

- Course Instructional Materials

The selected materials were authentic and contextualize language items. They were used as stimuli for appropriate language production and use. In this course, they varied from one part of the lesson and type of the activity to another. The required instructional materials included were divided over the three phases of the FC course (pre, in and post class). For more profound learning, FC was flexible in affording freedom to the students to decide about the best fitting instructional materials to their needs and learning styles.

A variety of instructional materials in the learning environment was provided encompassing visual aids, audio extracts, digital resources, documents, etc. YouTube videos, authentic oil industry specific articles and reports, textbooks, email and social media platforms were employed to clarify the course's key concepts and to reinforce different skills such as active learning, multi-sensory education, engagement, motivation and many others.

- Course Length and Timing

The course was scheduled to last for one semester with one hour and half for a face-to face-session per week. Pre-and post class timing depended on the learners' personal preferences and differentiated competences.

Timing was only considered for the in-class part of the lesson since FCM provides freedom to the learners to study at their own pace and allow them to decide the time plan that aligns with their personalized schedule tailored to their specific objectives, needs and availability.

- Course Setting

Studies took place in 'Class 18' which was a relatively large classroom in the Faculty of Hydrocarbons at the University of Kasdi Merbah- Pole 3.

- **English for Oil Drilling Lessons' Procedures**

Each of the lessons of the designed course was divided into three stages to conform to the FCM.

- **Pre-Class:** Instead of the traditional starter, warm up or ice-breaker, a pre-flipped step was launched. During this stage, students worked at home, before campus on a task. It provided them with an opportunity to gain first exposure prior to class material. It also involved them to prepare for class content. The initial stage consisted of an educational video or a text of a field-specific topic, followed by multiple choice questions about the presented content administered by the platform of Google Forms for the sake of evaluating learners' engagement and understanding of the introduced content on one hand and its effectiveness on the other hand
- **In-Class Stage:** The second phase started by a sort of quiz or any other warm up tasks to check learners' engagement of the received online content of the pre-session stage in addition to the smooth immediate movement of the teacher to introduce tasks to be performed by students in class. The teacher provided guidance without any explanation of

the lecture since learners were supposed to have it before class with the aim of fostering their autonomous learning and self-responsibility towards their studies.

- **Post Class:** The last phase was open to the learners' active participation and interaction, rather than just passive reception of the instructional content.

Table 13

Example of a Lesson Plan Template

University		Kasdi Merbah - Ouargla	
Faculty		*Hydrocarbons*, *Renewable Energies* and Earth and Universe Sciences	
Department		Drilling and Mechanics of Oil Fields	
Branch		Oil Drilling	
Chapter 1		Oil Industry Basics	
Lesson 1		Refinery Operations	
Language Skills		Listening - Reading- Speaking- Writing	
Resources		Vocabulary	Specialized technical terms related to petroleum refining industry and its complex processes
		Grammar	Present simple; passive voice constructions
		Pronunciation	Syllable and word stress
Instructional Materials	Pre-Class	**Video –** podcasts- **pictures** – flashcards – **quiz** – test–textbooks- digital educational apps and software- games	
	In-Class	Pedagogical Worksheets	
	Post Class	online learning platforms and discussion groups	
Academic Objectives		-Understand the fundamental refinery processes of crude oil. -Demonstrate the ability to communicate technical refinery terminology in English -Analyze the advantages and disadvantages of the refining techniques	
Occupational Objectives		Highly motivated and experienced to interact with people of different job titles and academic degrees using their communicative skills.	

Time	**Class Phase**	**Teaching and Learning Activities and Procedures**	**Learning materials**
Indefinite time	**Pre-Class**	Assignment	Video
1h 30	**During Class**	Activity 1 Activity 2 …	Pedagogical worksheets
Indefinite time	**Post Class**	Evaluation and feedback, enrichment follow-up assignments , reflection and self-assessment, etc.	online learning platforms and discussion groups

- **Target Skills**

In the modern teaching approaches, skills referred not only to "traditional abilities like reading, writing, listening, and speaking, but also to metacognitive skills such as planning, noticing, problem solving, evaluating, and correcting" (Anthony, 2018, p. 11). Therefore, the 21st century skills were highly emphasized since the study focused on the core of the digital

age regarding both technology uses in education and adopted teaching approach.

- **Teaching-learning Methodology**

The current ESP course was taught using Flipped Classroom Model typically based on blending face-to-face teaching and online instruction methods, supported by information sharing, tutorial teaching, group discussions, peer feedback providing. That is, it entailed two modes of delivery: self-access virtual learning and face-to-face tutorials.

Learners were assigned to actively take part in the learning process such as reading exercises, doing activities on worksheets, sharing subject-related content, discussing issues in groups and providing feedback either in physical class or online.

The inclusion of extra contact time outside class through digital tools and resources aimed to consolidate face-to-face and personalised learning such as clarifying grammar points. In addition, it sought to motivate learners to be self-directed for more effective lifelong learning.

- **Assessment Methods**

There were various available assessment tools through which learners' advancement were tracked in this study. The faculty administration scheduled two semestrial written exams of English comprising reading comprehension, questioning, text analysis, vocabulary, grammar rules and written production. The duration of the exams was one hour and half. After getting them, the learners' papers were corrected by their ESP teacher who provided the marks. The target goal of such testing was to diagnose the learners' and teachers' strengths and weaknesses to remediate any failures in meeting the requirements of the ESP course. The second exam called catch-up session was programmed by the end of the second semester for the students who failed the first one.

In addition, the current FCM depended heavily on ongoing or continuous and immediate assessment of learners' achievement concerning both the pre-class perception of

the digital materials and accomplishment of assignments and also post-class stage where students' contribution to the learning process and interaction with their peers and teachers was carried on through virtual remote communication channels after conventional classes. This was done via classroom or online participation, quizzes, presentations, self and peer reflection, or immediate feedback.

Table 14

Aligning Learning Objectives and Types of Assessment(Center for Teaching Excellence)

Types of Learning Objectives	**Types of Assessment**	**How to Measure**
Remember Students will be able to: 1. recall 2. recognize	Test items that require students to recall or recognize information: • Fill-in the Blank • Multiple Choice questions such as, "what is a…", or "which of the following is the definition... • Labeling diagrams • Reciting (orally, or in writing)	*Accuracy* – correct vs number of errors *Item Analysis* (at the class level, are there items that had higher error rates? Did some items result in the same errors?)
Understand Students will be able to: 1. interpret 2. exemplify 3. classify 4. summarize 5. infer 6. compare 7. explain	Papers, oral/written exam questions, problems, class discussions, concept maps, homework assignments that require (oral or written): • Summarizing readings, video, etc. • Comparing and/or contrasting two or more theories, events, etc. • Classifying or categorizing cases, elements, processes, etc., using established criteria • Paraphrasing documents or • Finding or identifying examples or illustrations of a concept, principle	Scoring rubrics that identify critical components of the work and discriminate between differing levels of proficiency in addressing the components
Apply Students will be able to: 1. execute 2. implement	Activities that require students to use procedures to solve or complete familiar or unfamiliar tasks; may require students to determine which procedure(s) are most appropriate for a given task. Activities include: Problem sets, labs, prototyping, simulations	Accuracy scores, Check lists, and Rubrics
Analyze Students will be able to: 1. differentiat e 2. organize 3. attribute	Activities that require students to discriminate or select relevant from irrelevant parts, determine how elements function together, or determine bias, values or assumptions in materials. These might include: Case studies, Critiques, Labs, Papers, Projects, Debates, Concept Maps.	Rubrics, scored by instructor, juries, external clients, employers, internship supervisor, etc.
Evaluate Students will be able to: 1. check 2. critique	A range of activities that require students to test, monitor, judge or critique readings, videos, or products against established criteria or standards. These activities might include: Journals, Diaries, Critiques, Problem Sets, Product Reviews, Case Studies.	Rubrics, scored by instructor, juries, external clients, employers, internship supervisor, etc.
Create Students will be	Research projects, essays, business plans, website designs, prototyping, portfolios.	Rubrics, scored by instructor, juries, external

able to: 1. generate 2. plan 3. produce		clients, employers, internship supervisor, etc.

In addition, the learners were able to assess their progress and give feedback about the whole teaching process in the post-test questionnaire provided by the researcher as well as in the post-class stage of FCM.

- **Evaluation of the Learning process**

To evaluate the learning of the study participants, the course developer conducted a comparison between participants' attitudes towards the FC teaching approach before and after the course implementation. This was done along with observing and identifying any enhancement in their engagement, motivation and interactions either online or during physical sessions.

- **Researcher's Role**

The researcher had assumed different roles. We had to make sure that all stages of the research went as smoothly as possible and that all participants felt comfortable and unaffected throughout this study. To that end, we asked for permission to conduct the study at the Department of Drilling and Mechanics of Oil Fields.

Moreover, the investigator explained the procedures of the whole process for the ESP teacher and learners, administered the research instruments and prepared the oil drilling course depending on the findings of the present target stuation.

During face-to-face sessions, the researcher sat at the back of the classroom, conducted observations, took notes and identified the noted criteria. There was no video filming or voice recordings of lectures and classroom procedures to normalize the course setting and avoid any external factors affecting the study. Complementarily, the researcher investigated the content of online students' contributions.

With respect to the pre-class phase of the course, it was the researcher's role to browse for suitable videos and learning resources on the Internet and design tasks using Google Forms. The link to those tasks was shared with the ESP practitioner to forward it to the students to be performed.

Conclusion

Chapter Four provided insights to the methodology used by the researcher in order to seek the impact that flipped learning would have on the engagement, motivation and achievement ofthe participants in the oil drilling classes. To that end, it employed both qualitative and quantitative methods to gather data.

This chapter was divided into two sections. The first section depicted the setting and the time frame of the study. It also provided details about the selected sample and the sampling techniques. During the course of this research, the researchers tried to provide a better understanding of the topic, to offer a comprehensive description of the research design, data collection tools, and data analysis strategies, and implement research methodologies. In addition, this chapter justified the decisions behind selecting the current research designs, sampling strategy, data collection and analysis techniques and tools. This aimed at promoting research transparency. Likewise, it served as a guide for any future replication of the study. Additionally, it attempted to address any potential limitations and sought to identify and apply strategies to overcome them. In parallel, the scope of the research was narrowed down through deciding on its delimitations in order to make the investigation more focused and manageable.Based on the findings of the needs analysis questionnaire and the description of the present situation, a course was designed and implemented according to the FC framework. Following this step, observations, questionnaires, and interviews were administered to describe the impact of designed course on the target situation. Digital tools such as emails and Google Forms were employed to enhance the quality of the collected data and analysis

process.

In addition, the second section of Chapter Four depicted the design and implementation steps of the oil drilling course in its second section. It presented in detail the adopted teaching theories and strategies within the FC framework, the learning objectives, instructional conventional and digital materials, learning activities, and a suggested template of an ESP lesson using FC framework. Furthermore, this section addressed the target skills to be activated and fostered along with gaining ESP knowledge (English language functions and structures) including active learning, group work, discussions, and problem solving. The compiled data was, then, used to demonstrate the impact that a flipped classroom approach had on the research participants' engagement, motivation, and performance in the context of Kasdi Merbah University.

The coming chapter presented an in-depth analysis of the data collected from all the research tools employed during the course of this research. This analysis was done regarding the efficiency of FC in designing and delivery of an ESP course, specifically tailored for oil drilling students at Kasdi Merbah University in Ouargla.

Chapter Five

Chapter Five: Research Findings

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Introduction

The previous chapter entitled '*Research Methodology Description*' depicted in its first section in detail the philosophical background to the current mixed- research type, blend of quasi-experimental and action research design, mixed methods approach, the setting, the participants, sample size and techniques, data collection and analysis instrumentation and validation and practicality and procedures, measuring the validity and reliability of the findings. The second section was a description of the steps and components of the designed flipped classroom English course for Master 1 oil drilling students.

This chapter focused mainly on objectively reporting the primary findings of the administered data collection instruments to be followed by the discussion chapter later where extensive interpretation and explanation of those results took place. It tried to analyze data and present the findings in relation to the already set research questions:

- To what extent will FCM prove effectiveness in designing and teaching English for Oil Drilling students at Kasdi Merbah University?
- How will the attitudes of oil drilling students and teachers at Kasdi Merbah University be towards FCM?
- How does FCM address the specific needs and preferences of adult learners?
- To what extent does the implemented teaching approach align with the 21st century skills among learners?

Throughout the course of the analysis of the gathered data, a strict organization of its steps was set as order had a significant impact on the overall conduct and interpretation of the results of this study in particular. To explain more, the results of needs analysis and description of the study setting before conducting the intervention provided the foundation for the designed course and all the coming procedures.

From another perspective, the pre-post study design was opted for with the aim of permitting the researchers to comprehensively evaluate the impact of the FC intervention in oil drilling classes by comparing the research outcomes before and after its delivery. For those purposes, moving from needs assessment to intervention design, implementation and evaluation in a strict sequence of analysis steps was vital for ensuring the integrity and coherence of the study's methodology and findings.

With respect to the organization of this chapter in the current study, mixed-methods research design entailed the combination of results of both qualitative and quantitative data analysis. The analysis phase was divided into three phases: pre, during and post FCM implementation. It started from the obtained results from the observations and tracking learners' achievements and engagement during the course. Then, it ended with evaluating the attitudes of the study participants towards integrating digital technologies in higher education, mainly the use of modern teaching approaches, taking FCM as a case in point. Thus, such order was imperative for guaranteeing the integrity and logical flow of the study's final findings.

5.1. Pre-Intervention Data Analysis

5.1.1. Analysis of Student Needs Questionnaire

The Needs Analysis questionnaire was edited then translated into Arabic, and next designed using Google Forms, sent via the collected emails of the learners that were present during the sessions of English. An associated spreadsheet was opened to save students' responses, make necessary statistics and create visualizations. The collected data were organized in main themes and categories to facilitate their analysis and interpretation. Regarding qualitative information obtained from open-ended questions, a content analysis was performed to identify key themes, patterns, and insights via calculating the frequency of specific viewpoints or concepts within the participants' responses.

The questionnaire was sent to 31 out of 106 oil drilling students via their email addresses. Yet, responses were obtained from 26 students, with a percentage of 29.25%. The analysis of the collected data was presented in the order of the posed questions in the first place.

1) **I accept that my answer to this questionnaire will be used for the current research.**

All participants agreed to complete the Needs Analysis questionnaire so that they would submit details about their preferences, lacks, levels, and expectations from learning ESP as well as their attitudes and motivation towards the integration of digital tools and modern teaching approaches for an effective learning of this module.

These participants were notified that their responses would be used exclusively for academic purposes within the limits of the current study. Simultaneously, they were contributing to the academic arena as cultivated and responsible individuals while their identities were kept anonymous. In a nutshell, this participation agreement statement was intended to ensure the transparency of the research findings and showcased the respect of ethical protocols. The percentage of consent for responding to the questionnaire was 100%.

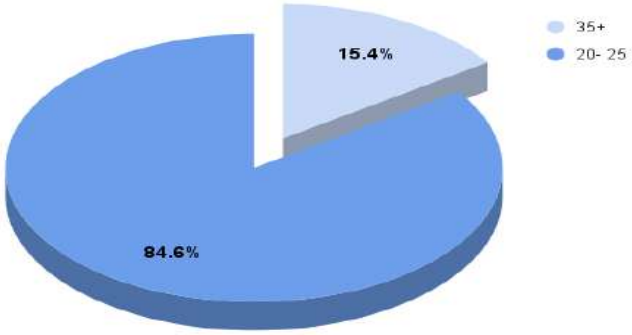
Section 1: Demographic information

2) **Age**

The needs analysis questionnaire collected details about learners' age. The students were divided into three age categories: 20 to 25, 25 to 35, and more than 35 years old. The findings showed that the largest portion of the respondents fell within 20 to 25 years old age group with a percentage of 84.6%. The second age category ranging from 25 to 35 years old was totally absent from the study sample. The study captured a percentage of 15.4% of the age range of 35 years old.

Figure 154

Study Participants Distribution over Age Categories

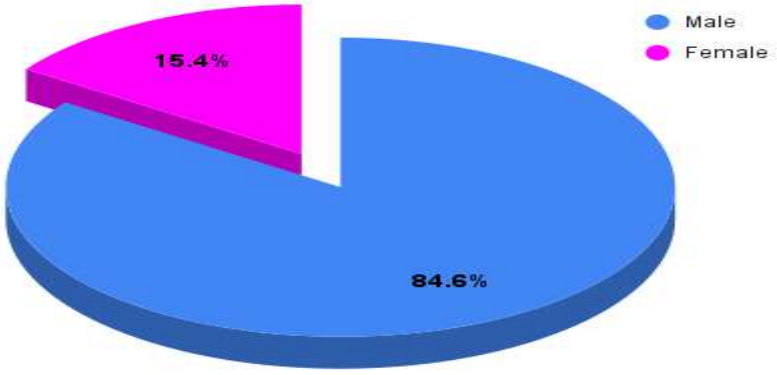


3) Gender: Male or Female

According to the responses, the two genders were present among the study participants, yet with significantly different rates. Males accounted for an overwhelming 84.6% of the total data providers. By contrast, the female portion of the sample accounted for only 15.4% of the total.

Figure 165

Gender Composition of the Participant Sample



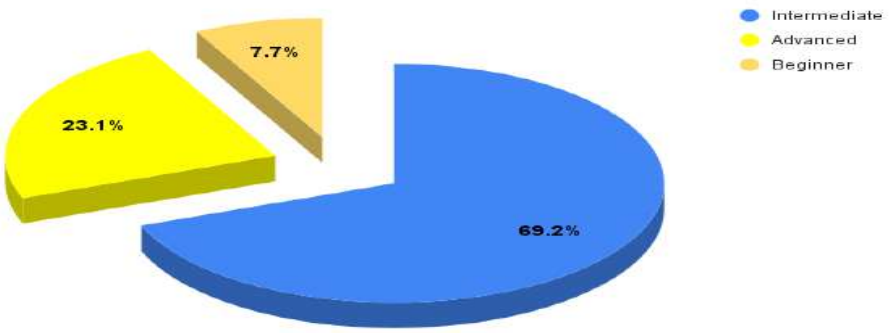
Section 2: Learners' Experiences and Attitudes towards Learning English

4) In which level would you classify your English proficiency? Beginner, Intermediate, Advanced

The English proficiency level breakdown showed that only 7.7% were beginners, 23.1% were advanced while the intermediate level accounted for 69.2% of the total participants.

Figure 176

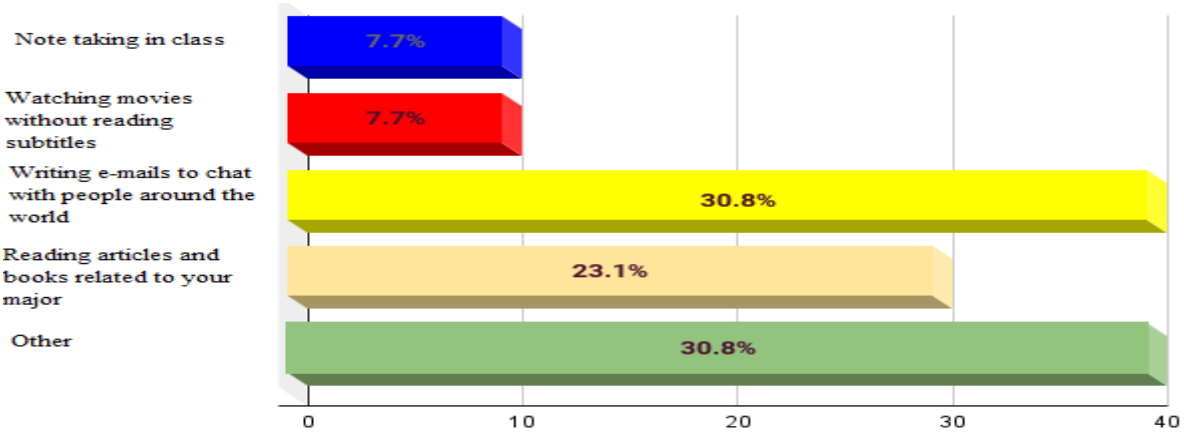
English proficiency Level of the Study Participants



5) What do you use English for?

Figure 187

Respondents' Uses of the English Language



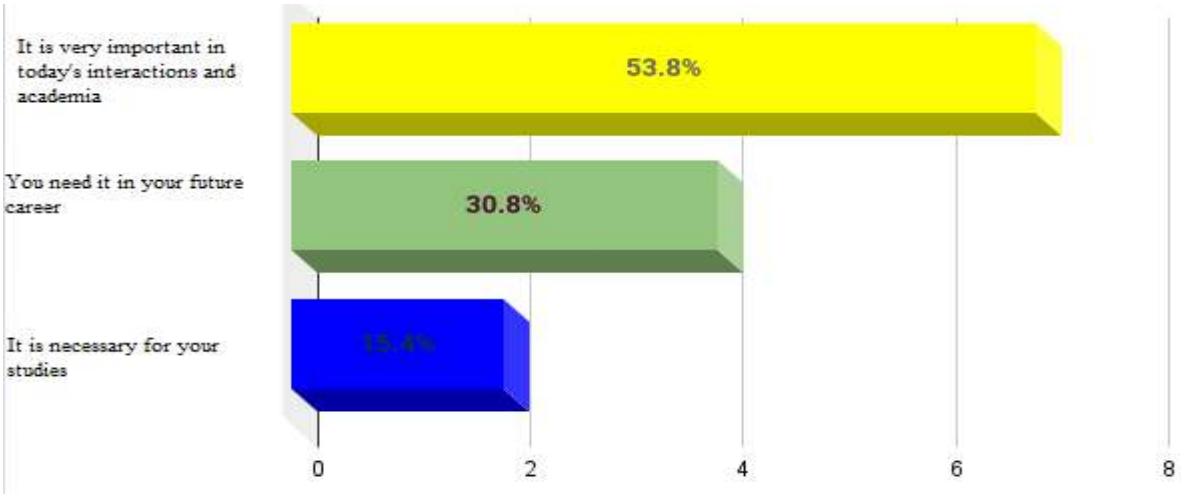
Concerning the domains in which English was used by the selected sample of oil drilling learners, 30.8% of them needed it for communication with people around the world writing e-mails. The same percentage appeared for students who used it for "other" issues. The latter encompassed attending international online conferences and seminars and

involvement in English-speaking clubs and forums related to the students' discipline. Reading articles and books related to their major made up 23.1% of the sample. Both options of watching movies without reading subtitles on one hand and note taking on the other accounted for 7.7% of the English language activities they engaged in.

6) What are your main goals out of learning English?

Figure 198

Oil Drilling Students' Objectives for Learning English Language



The replies to this question aimed to shed the light on the oil drilling students' main reason behind learning English. A substantial percentage of 53.8% of the participants affirmed the significant value of English in today's interactions and academia as an international language. The data revealed that 30.8% of the participants considered it as a prerequisite for the future career. 15.4% of the participants had a belief of its necessity in their studies. No other suggestions (0%) for the probable objectives of learning English in the view of the data providers.

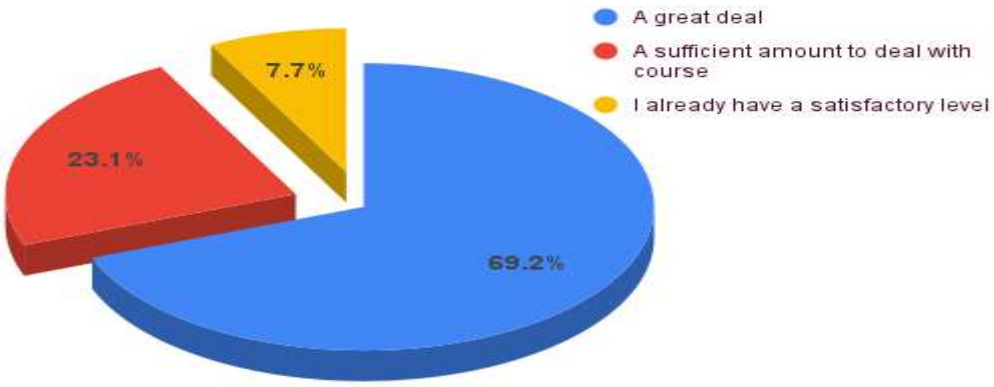
7) To what extent do you need English in your studies?

The overwhelming majority of 69.2% of the total respondents confirmed that they needed a great deal of English to carry on their studies. 23.1% of them believed that they need only the sufficient amount enabling them to deal with the course. 7.7% had already acquired a

basic background in English satisfactory enough to meet the demands of their academic endeavours. No one of the respondents viewed English as completely unnecessary at all in oil drilling discipline.

Figure 209

Level of Necessity of English for Oil Drilling Studies

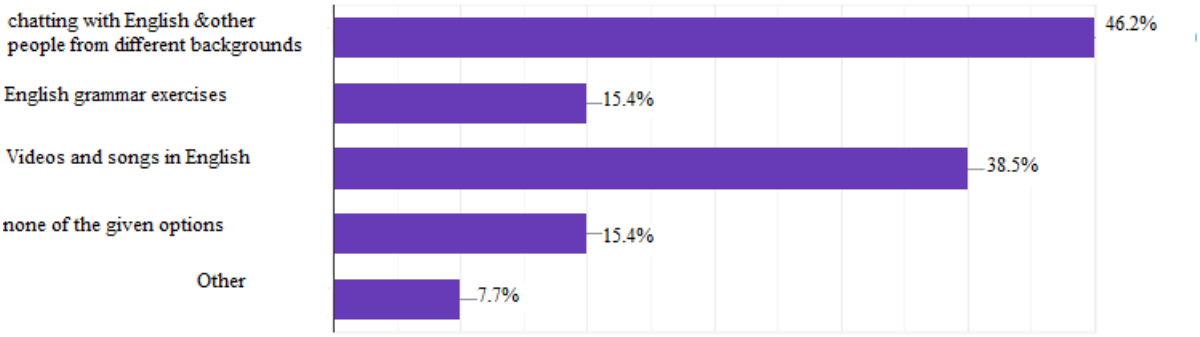


8) **You best learn English through: Chatting online with English and other people from different nationalities/ English grammar exercises/ Videos and songs in English/ None of these/ Other**

In this checkbox-style question where respondents were enabled to select multiple options, the respondents expressed their preferred ways of learning English by selecting from available options.

Figure 30

Best Ways of English Language Learning



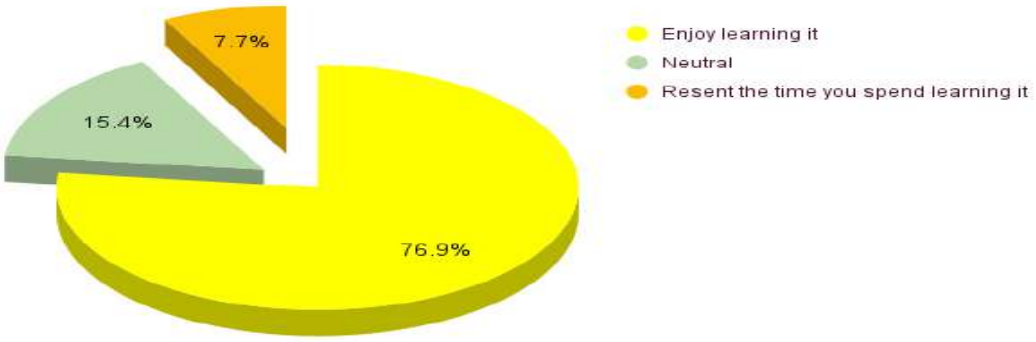
The most common strategy was chatting with English and other people from different linguistic backgrounds, representing a percentage of 46.2% of the sample. Videos and songs in English as technique for learning English fell in the second rank with a percentage of 38.5% of the participants. English grammar exercises on one hand and 'none of the given options' on the other hand represented an equal portion with 15.4% of the respondents for each. The option 'other' was chosen by a percentage of 7.7% of the total of the obtained responses, without any clarifications.

9) **What is your attitude towards studying English?**

The collected data for this question would be compared later with the learners' attitudes towards learning English justifying whether the designed flipped course was effective via describing and identifying any changes in these attitudes. In this part, the lion's share of respondents (76.9%) indicated that they enjoyed learning English. A portion of 15.4% of data providers did not seem to advocate for or against studying English in their field of study. A marginal fraction of the sample (7.7%) exhibited resentment to learning this language.

Figure 31

Oil Drilling Learners' Attitudes towards Studying English

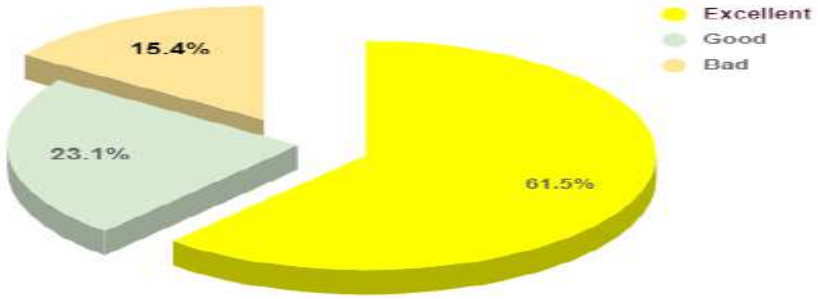


10) **How can you describe your English learning experience before Master's enrolment?**

A considerable share of the sample constituted of 61.5% depicted their English learning experience as being ‘excellent’. A considerable difference in the stance towards students’ English learning journey was reflected in the portion of 23.1% for ‘good’ experiences and 15.4% for ‘bad’ backgrounds.

Figure 212

Evaluation of English Learning Experience before Master’s Enrolment



-Why?

Each of the respondents supported their stances with a justification. They were summarized into two main attitudes: positive and negative. First, the positive views stem from the innate motivation since childhood to watch movies and play video games depending on English language. In the same vein, others defended it for its prestigious and valuable status as a dominant global language. In addition, it is the language of communication of oil and gas international community and sector. These justifications were labelled under issues matched to the language per se. Another respondent stressed the role of the teacher in motivating good learning by stating “I had a good teacher, so it was an enjoyable experience” and “it was simple and fun”. Other answers made daily practice a central point leading to progress in this issue whereas some participants believed in positive psychological impact in bringing about improvements on their personality and skills. Immersive learning environments brought awareness of its necessity and encouraged their advancement will. The affirmation of this case came as follows “I travelled outside Algeria, and thanks to it, I was comfortable and did

not experience any misunderstandings or the desire for obtaining anything. The language was not a barrier for me at all".

Though most of the statements were centred on the advantages of studying English, the second position portrayed it as a challenge by claiming that the instructional strategies were the cause. The justification was 'the teaching methods were ridiculous and did not help me". Other respondents redirected the discussion back to the nature of English itself as being "a difficult language to learn".

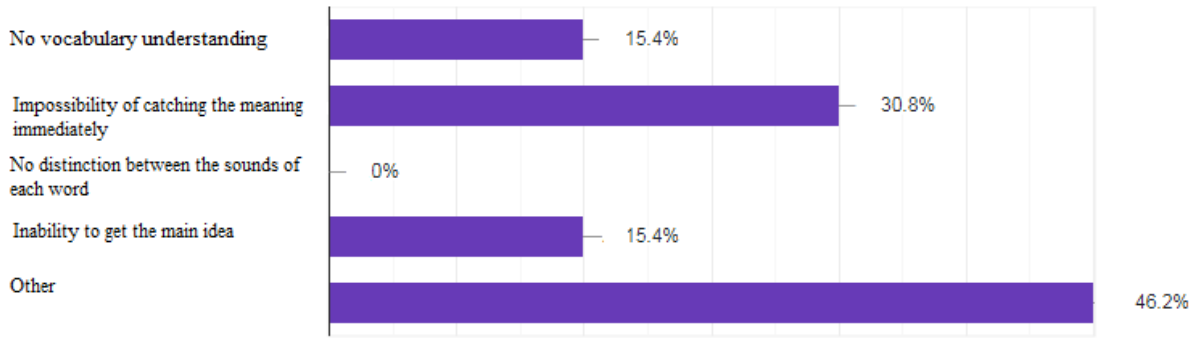
Section 3: Learners' Difficulties Related to English Learning Four Skills

11) What are the problems you face when you listen to English extracts?

According to the responses to checkbox-style question represented in the bar chart, a sizeable majority of the learners forming a percentage of 46.2% faced other problems such as difficulties in comprehending regional accents that differ from what they are familiar with when listening to English extracts. The impossibility of catching the meaning immediately after listening to the extract consisted of 30.8% of the responses. This was followed by a portion of 15.4% for each of lack of vocabulary understanding and the inability to get the main idea. However, no one of the respondents (0%) had a problem with the distinction between the sounds of each word.

Figure 223

Learners' Challenges with the Listening Skill

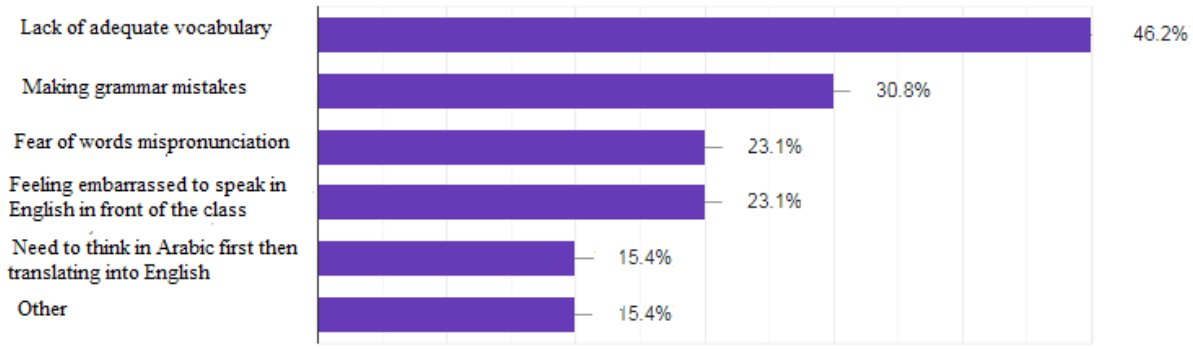


12) What are the problems you face when you speak English?

The bar charts reflected the order of the speaking skill obstacles confronted by the data providers. Lack of adequate vocabulary was spotted as the main problem represented by a percentage of 46.2%. Making grammar mistakes were found in 30.8% of the responses. The options related to fear of words mispronunciation on one hand and feeling embarrassed to speak in English in front of the class on the other were noted with a similar portion of 23.1% of the total replies. Need to think in Arabic first then translating into English as well as other possible problems such as fear of critics 15.4% for each. The results were summarized in this column charts.

Figure 234

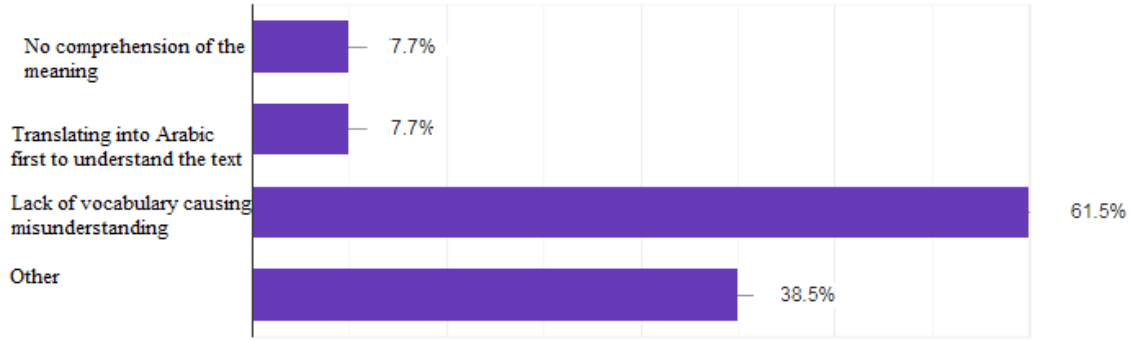
Learners' Challenges with the Speaking Skill



13) What are the problems you encounter when you read English passages?

Figure 245

Learners' Challenges with the Reading Skill



Moving to the issue of reading, there was a great emphasis on the lack of vocabulary leading to misunderstanding with a sizeable majority of 61.5%, reinforcing the previous

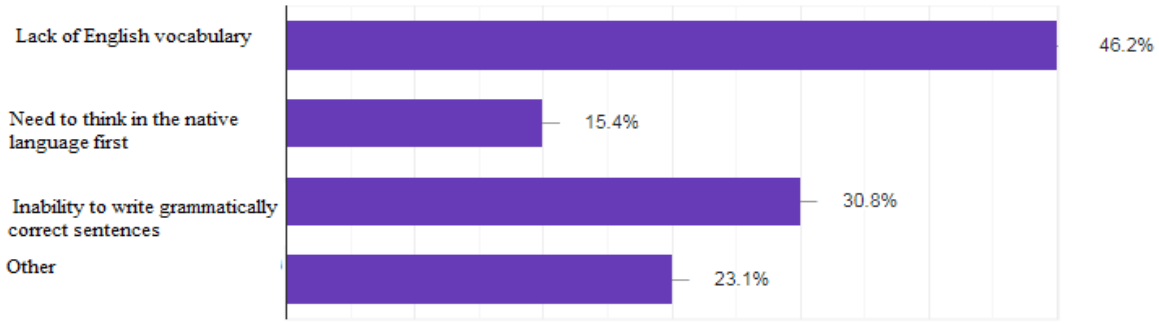
obtained findings. A rate of 38.5% of the total was made up by other problems such as inability to visualize the technological processes and engineering principles involved in their field of study out from reading passages. The lack of meaning comprehension as well as the need of translating first into Arabic to understand the texts accounted for 7.7% of all answers for each of them.

14) What are the problems you encounter when you write in English?

The challenges with writing skill breakdown showed that a substantial proportion of the sample consisting of 46.2% was struggling with lack of English vocabulary when producing written passages. Building grammatically correct sentences was another relatively stressed issue with a percentage of 30.8% of the total responses. Other difficulties that the target students faced composed 23.1% of all the replies. The 'other' option encompassed instances such as the lack of confidence in written expression and complicated situation of finding the most fitting vocabulary to convey intended meaning. Once again, no need was seen by these students to initially think in Arabic before engaging in the writing process. This was reflected in the small proportion of 15.4%.

Figure 256

Learners' Challenges with the Writing Skill

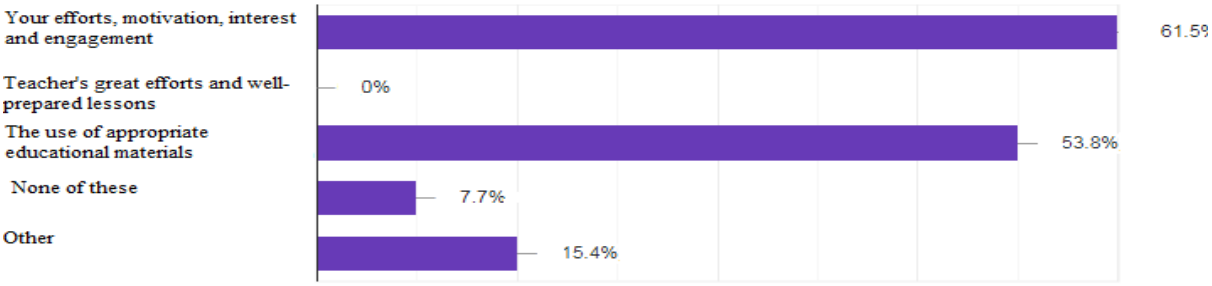


15) Improving your English level is related to: Your efforts, motivation, interest and engagement- Teacher's great efforts and well-prepared lessons- The use of appropriate educational materials -None of these -Other

The figure below summarized the level of importance given by the target learners to the key factors leading to enhancing their English proficiency. They highlighted the crucial role of their efforts, motivation, participation and engagement to the effectiveness of language learning improvement with a percentage of 61.5% of responses. By contrast, they considered teacher's effective instructions and engaging lessons to be one of the core elements in the successful learning process, as only 0% of responses indicated this factor as important. The learners pointed to the importance of using appropriate educational materials by a percentage of responses of 53.8%. A proportion of 7.7% of the total responses went to none of these aspects. The option 'other' made it probable of existing factors other those listed before and it accounted for 15.4% of the sample's replies.

Figure 267

Core Factors for Advancing English Proficiency



Section 4: Learners' Description of Good Course Criteria

The questions from 16-30 were of multiple-choice grid style (Likert Scale) collected in together as having the same aim of assessing the level of agreement of the respondents to criteria of a good lesson. For a better presentation of the findings, the column chart was divided to depict a set of elements each time.Figure 38 represented the findings of the questions 16, 17 and 18.

How do you describe your best English course? (1 Strongly disagree - 5 Strongly agree).

In the coming analysis of the obtained data, a remarkable relative high rate of the neutral responses was recorded. They indicated respondents' uncertainty about the posed

ideas. There were also clearly stated respondents' needs, experiences and perspectives when analyzing the collected data.

16) In this course, I have the opportunity to express my ideas.

In the response distribution, the option 'Strongly Agree', indicating that most students prefer courses which provide them with opportunities to freely communicate their ideas. By contrast, a small percentage of respondents who opted for 'Disagree' option, did not consider this aspect as a fundamental criterion for a course to be good.

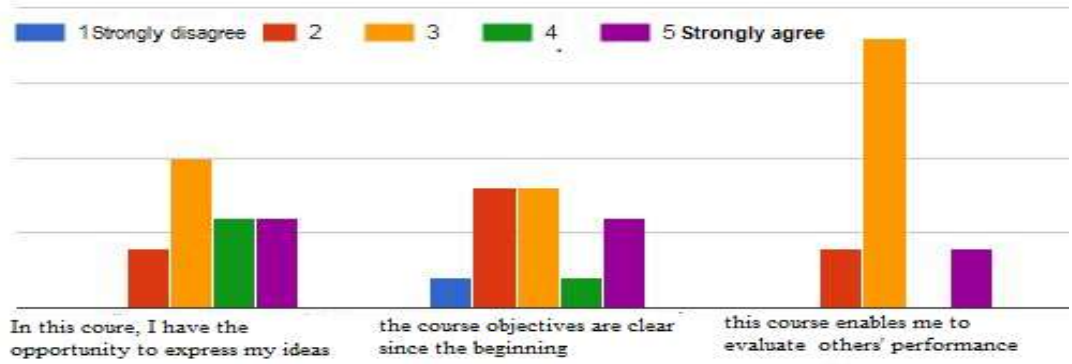
17) The course objectives are clear since the beginning of the course.

The responses were divided between agreement and disagreement regarding the clear setting of course objectives right from the beginning of the course. There was no clear consensus about the significance of such aspect in the design of the course.

18) This course enables me to evaluate others' performances.

Figure 278

Criteria of a Good Course: Emphasis on Communication, Objectives, and Peer Feedback (questions: 16, 17, and 18)



The responses balanced between 'Strongly agree' and 'Disagree' ends of the scale, suggesting that the criterion of providing feedback or assessment for peers was not considered as a key feature in the course design in the view of the students. They depended on other sources for feedback other than their peers.

19) In this course, I have the opportunity to collaborate with peers to perform tasks.

The responses highly centred on ‘strongly agree’ and ‘agree’ regarding the importance of collaborative learning among peers in achieving instructional activities.

20) In this course, I use online language learning tools.

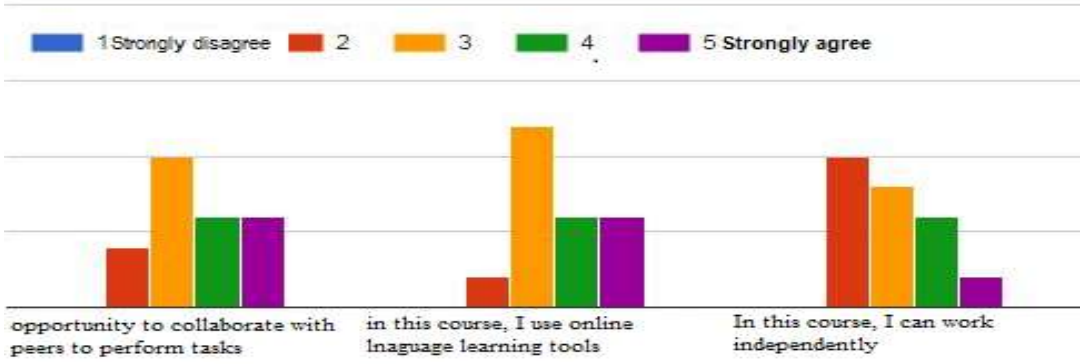
The responses heavily inclined towards ‘strongly agree’ and ‘agree’ end of the scale while there was little to no disagreement regarding the integration of digital learning tools as a vital element in English language classes.

21) In this course, I can work independently.

The responses were balanced between agreement ends and “Disagree” options on the scale, showing the division of learners around independent learning in ESP classes. Still, some learners believed they could not work independently in the course.

Figure 289

Collaborative and Independent Learning and Online Instructional Materials (questions: 19, 20, and 21)



22) The interaction with my teacher helps me develop my linguistic abilities.

The chart exhibited an overwhelming agreement on the role of teachers’ guidance in communicative tasks on the improvement of the linguistic proficiency. A minority of respondents denied that impact.

23) The interaction with my peers helps me develop my communication skills.

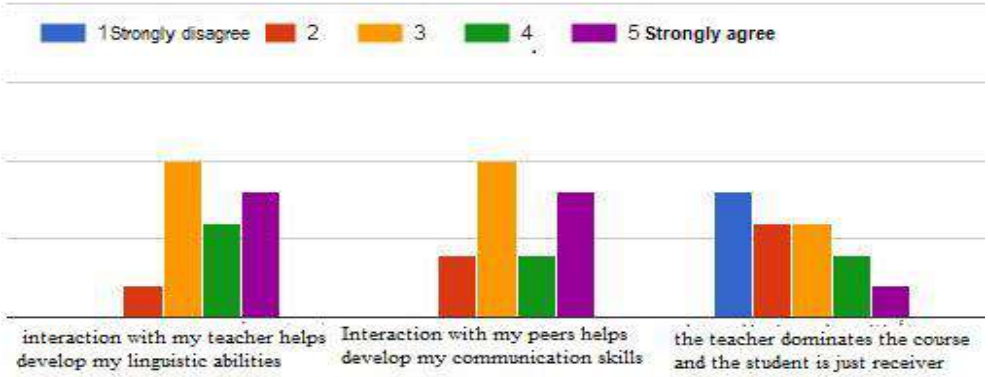
The response distribution leaned towards ‘strongly disagree’, indicating that their peers had no influence on the enhancement of their communication skill. Little agreement was claimed by those who were apparently experienced to interact with their mates in English.

24) The teacher dominates the course and the student is just a receiver.

The most prominent feature of the responses rate for this element was the high level of learners maintaining a neutral stance. This indicated that they were uncertain about whether the impact of the teacher’s dominance over the course would be positive or negative. In addition, the relatively high inclination towards agreement showed some students’ acknowledgment of the teacher as a fundamental element in the lesson. Only a few refused the learners’ passivity in gaining knowledge.

Figure 40

Student Perceptions of Classroom Interactions and Roles (questions: 22, 23, and 24)



25) The teacher uses learning videos in class.

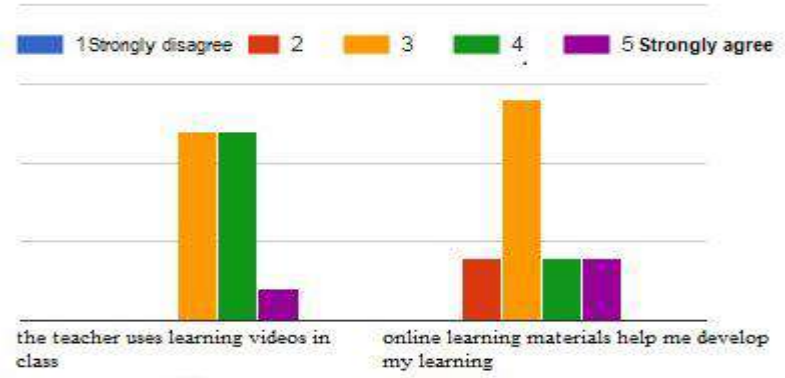
The responses scale was mainly around ‘agree’ option. Not a single respondent denied the significance of integrating learning videos in the course. The sizable rate of the learners leaning towards being neutral indicated that they were undecided about the efficiency of using videos in ESP classes as shown in Figure 41.

26) Online learning materials help me develop my learning

The responses distribution leaned towards expressing agreement on incorporating digital materials to improve the educational process. Only a minority of the respondents believed in the ineffectiveness of those tools and resources. Learners opting for neutral stance were highly represented. This reflected these participants' uncertainty about the impact of digital instructional materials in enhancing the quality of education.

Figure 41

Significance of the Instructional Materials in Class



27) The in-class activities are communicative.

The overwhelming majority of the participants agreed on the necessity of including activities stimulating communication in class. A marginal proportion disagreed with this concept. Once again, the neutral opinions comprised considerable amount of the total responses collected for this issue. This exhibited inability to decide on the role of communicative tasks on improving language proficiency.

28) The students are the major participants in class.

This statement was reliability checks or internal consistency checks. Its inclusion was with the aim of examining the consistency of learners' responses. Its concept covered the description of ideal ESP teacher's and students' roles, same as 'question 24'. Regarding learners' engagement in class activities, a vast majority was in favour of active role for the learners. However, no one of participants opposed this claim. Interestingly, a considerable

number of respondents maintained a neutral position towards this issue, indicating that they were unsure about level of teacher's guidance for class.

Comparing the findings of the two previously mentioned questionnaire elements, the data showed a high level of consistency in uncertainty among respondents about the teacher guidance and student autonomy required level. Thus, balancing teacher's and students' roles in would be one of its features of the designed course.

29) Students make oral presentations in English.

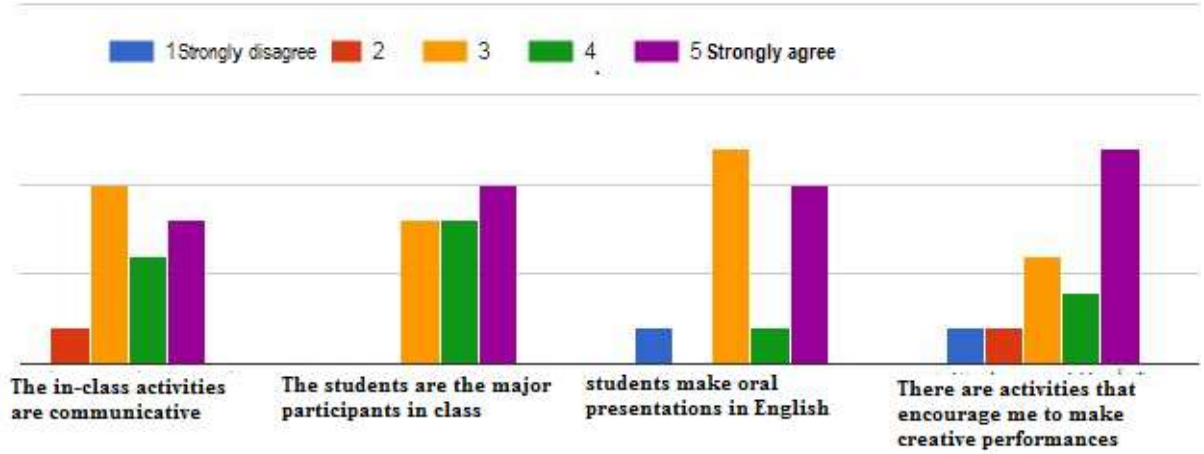
This cross-checking statement aimed to verify the consistency of the responses highlighting the learners' perspectives towards communicative tasks. Similar to the previous findings, a predominant majority of the responding students affirmed their readiness and recommendations to include oral presentations as class activities in search for improving their English proficiency. Only a small percentage of the sample expressed their disagreement to the use of oral presentations as a regular activity in the ESP classes. One more time, the neutral stance had the highest rate of responses, indicating uncertainty towards this task efficacy.

30) There are activities that encourage me to make creative performances (hands-on interactive activities like making projects/ watching videos/ role plays, etc)

From the data, the hands-on interactive activities gained an overwhelming majority of the overall responses. An overwhelming number of study participants opted for 'strongly agree'. The combined percentage for 'disagree and strongly disagree' was heavily lower than those stating agreement. A neutral perspective on the subject made up a considerable share of the overall feedback received on this matter.

Figure 292

Students' Perspectives on Class Engagement

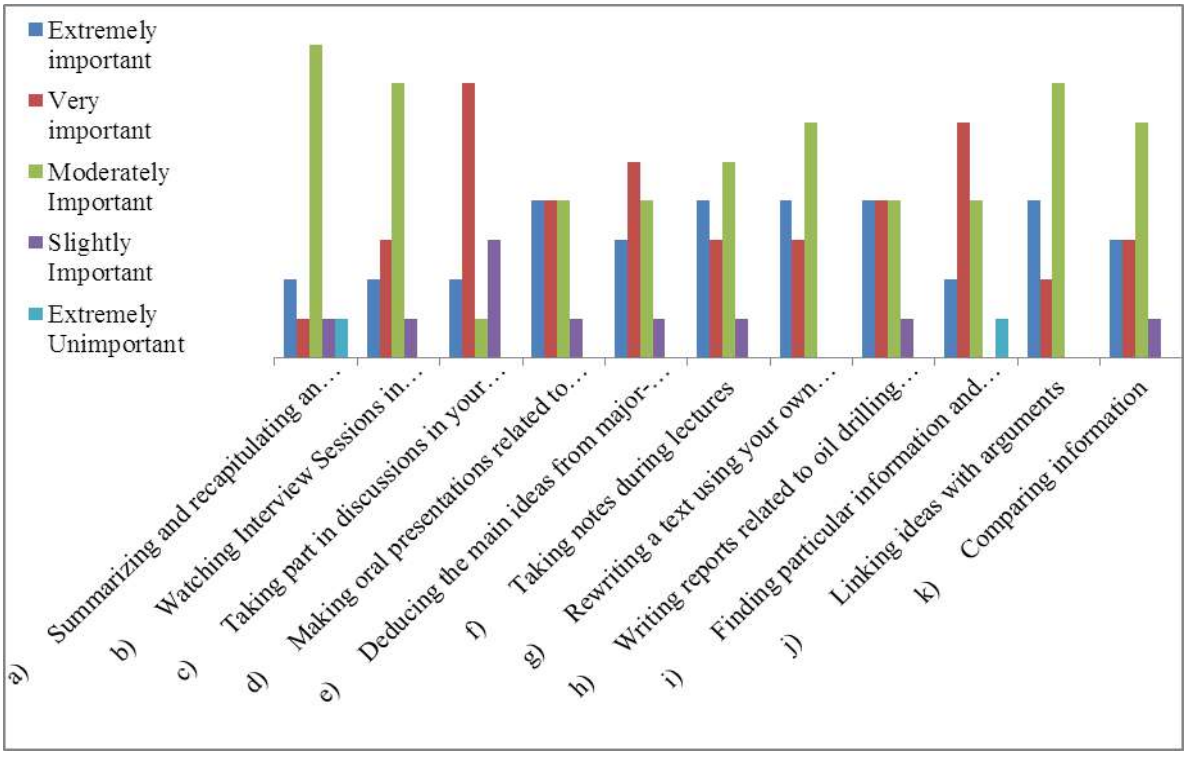


Section 5: Learners' Preferences Related to the Types of Classroom Activities

31) How important are the following skills so that they should be integrated in your English class? (1 extremely unimportant - 5 extremely important)

Figure 303

Significance of Learning Skills in ESP Course



In this section, Likert Scale was employed to measure the level of importance of the learning skills accompanying language acquisition (critical thinking, problem-solving, collaboration, creativity, etc). In fact, these activities were representing skills which we could not name directly in order to avoid the lack of understanding of terminology related to language didactics by the oil drilling students. For instance, by rating the activity of summarizing an audio or written text, the students were highlighting the importance of skills such as reading comprehension, active listening and concise communication.

The needs analysis questionnaire respondents rated those skills' importance by ranging them from extremely unimportant to extremely important. The findings of this section were summarized in Figure 41

a- **Summarizing and recapitulating an oral, written or audio text (a conversation/ a speech/ a video)':** This sort of activities stimulates learners to analyze the received information, extract the main ideas, and communicate them in their own words. The collected data showed that the activity of 'summarizing and recapitulating an oral, written or audio text' was generally rated as important, with 16 respondents for 'Moderately Important', 4 respondents for 'Very Important', 2 respondents for 'Slightly Important', and 2 others for 'Extremely Unimportant'.

b- **Watching Interview programs in English:** Attending interview broadcast in English develops learners' listening comprehension skills and enriches their vocabulary repertoire. It also facilitates language learning through exposure to authentic language and cultural situations. According to Suparman (2017), conversations encourage learners to be more active in classes.With respect to the collected data, a large portion of respondents considered this skill as important, with some variation in how essential this skill is perceived to be. Out of 26 respondents, a majority of 14 respondents rated this skill as Moderately Important, a significant number 10 rated it as Extremely Important or Very

Important, indicating that they see this as a highly valuable skill. However, a marginal minority of 2 rated it as Slightly Important and none of them saw it as Extremely Unimportant.

c- **Taking part in discussions in your field of study:** This learning activity aims to develop learners' potential to engage in social situations in order to learn from their peers, their instructor and the employed instructional materials using their cognitive skills (Maurino et al., 2007). The response distribution inclined towards the high value of discussion skill. A significant number (14 out of 26) rated this skill as Very Important. A small number (4) indicated that it had a moderate level of importance. However, a significant number (6) rated it as Slightly Important and no one rated it as Extremely Unimportant.

d- **Making oral presentations related to your major:** The respondents' views highlighted the level of importance of the current activity by noting the same rate (8 out of 26) for each of Extremely Important, Very Important and Moderately Important. The small number (2 out of 26) recorded for Slightly Important could also be considered in favour of valuing this skill. In the same vein, none of the respondents perceived it as less critical.

e- **Deducing the main ideas from major-related texts and articles:** The responses implied that a predominant share went to Very Important (10), then Moderately Important (8), followed by Extremely Important (6). A negligible percentage of the population (2 out of 26) rated this activity as Slightly Important. Not even one respondent reported it as Extremely Unimportant.

f- **Taking notes during lectures:** This strategy aimed to foster active listening, data synthesis, ranging information, critical thinking, and attentiveness skills. In this study, the majority of respondents (10 out of 26) rated this skill as Moderately Important. A sizable number (8 out of 26) rated it as Extremely Important. Very Important option came in the third rank with a notable number (6). A small minority (4 out of 26) rated it as Slightly

Important or Extremely Unimportant, suggesting a few respondents view this activity as a less critical skill.

g- **Rewriting a text using your own words in English**: This technique primarily intended to prompt reading comprehension, engage in critical thinking, reconstruct the information in a concise way, and clearly communicate it. When it came to the importance of this particular strategy, a vast majority of respondents (12) was placed in the Moderately Important category. However, a substantial proportion, 14 out of the 26 participants, viewed the skill as extremely important (8) or very important (6). Conversely, the findings indicated a complete absence of instances of slightly important or extremely unimportant, suggesting that data providers attributed valuable significance to this ability.

h- **Writing reports related to oil drilling in English:**The expected objectives of this activity is prompting critical thinking to analyze complex technical information, problem-solving to find out and present solutions, and efficient communication to deliver the findings transparently and concisely. Moreover, this strategy develops the spirit of research and technical writing strategies. Most of the responses to the questionnaire exhibited views regarding the significance of this skill fell into important rating, recording similar number (8) for each of Moderately Important, Very Important and Extremely Important. On the other end of the spectrum, a small number (4) perceived the skill as slightly important. Not a single respondent considered it as extremely unimportant.

i- **Searching for particular information and details in a hydrocarbons text**: This is intended to develop reading comprehension and identifying relevant facts and figures in technical content. The majority perspective, held by 12 out of the 26 respondents, was that it selected Very Important level. However, a sizable number, comprising 8, deemed the skill to be moderately important. In the same spectrum, a small minority of 4 respondents

considered it as Extremely Important. On the other side of the line, only 2 participants assessed it as extremely unimportant while there were no instances of Slightly Important.

j- **Linking ideas with arguments:** Its goal is to teach students ways to use English to defend their beliefs and viewpoints to convince their counterparts. As far as the importance of this activity is concerned, the majority of respondents (14 out of 26) assessed this skill to be as Moderately Important while a substantial portion (12 out of 26) viewed this skill as highly valuable, rating it as Extremely Important (8) or Very Important (4). However, there were respondents who accounted for its perception as Slightly Important or Extremely Unimportant.

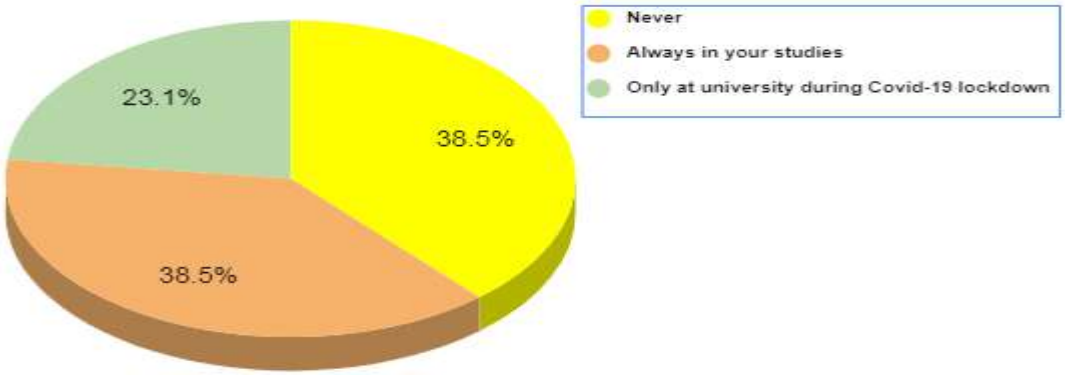
k- **Comparing information**: The obtained data exhibited that a significant subset of the respondents (12 out of 26) rated this skill as Moderately Important. Additionally, a notable number (6) indicated it as 'Extremely important' and the same share (6) rated it as Very Important. A negligible minority (2 out of 26) viewed it as Slightly Important. Yet, absolutely no respondents suggested that it was Extremely Unimportant.

Section 6: Learners' Experiences with Online Education

32) When have you had experience with online education in learning English?

Figure 314

Online Learning Experiences Frequency during Academic Career



The pie chart summarized the findings for the question related to respondents' engagement in online learning modalities throughout their academic journey. A percentage of

38.5 % of the total revealed that they had not encountered any form of online classroom environments over the course of their academic career. The same portion was demonstrated by those showing a persistent participation in such learning approach. Lesser than this was the percentage (23.1%) describing those who adopted online learning tools and resources in their university studies exclusively during the exceptional circumstances of the COVID-19 lockdown.

33) Which problems have you faced while studying online?

Concerning the challenges hindering the efficiency of online learning, the availability and access to the Internet accounted for substantial percentage of 69.2% of the total responses. Moreover, downloading errors, installation problems and login issues comprised 23.1% of the difficulties impeding students from obtaining the required content to participate in virtual learning activities. Only 15.4% of the participants suffered a lack of technology manipulation skills. Complying with the foundational hypothesis of the current study, all data providers possessed some sort of technological devices such as laptops or smartphones. Although the option 'None of these options' was selected by 7.7% of the population, the respondents did not suggest any additional factors beyond the options already presented in the questionnaire.

Figure 325

Online Learning Challenges

5.1.2. Analysis of the ESP Teacher Interview: Pre-Intervention Insights

The analysis of the collected data departed from exploring the needs of the oil drilling students. This was intended to obtain foundational data about their initial linguistic backgrounds, preferences, perspectives and experiences with online teaching approaches before designing and implementing the study intervention, notably the flipped ESP course.

In the same section, the analysis of the teacher pre-study interview came after students' needs analysis, attempting to depict the context of the ESP instruction, teaching methods preferences, and expectations from the study.

In the same way the study conducted with students, the two teachers were informed about the objective of the study related to investigating the effectiveness of flipped classroom courses in teaching ESP in the Department of Mechanics and Drilling of Oil Fields, along with a commitment to protecting the anonymity and confidentiality of the personal data. So, we used the label of 'Teacher A' to the female teacher and 'Teacher B' to the male one to preserve that anonymity.

The analysis of the data obtained from the responses of the Oil Drilling English teachers started by dividing them into seven underlying themes: Demographic information, teaching approaches and content, teachers' evaluation of oil drilling students concerning proficiency level, instructional materials and technology, types of learning activities and homework, online teaching modalities employment, assessment techniques, students' challenges with English proficiency.

Section 1: ESP Teachers' Profile

Question 1: What age category do you belong to? (20- 25; 25-35; 35+)

Teacher A belonged to the age category of 20-25 years old while Teacher B was over 35 years old. These differences affected their experiences in teaching ESP (Table 15) .

Question 2: Are you an engineering ESP teacher or an EFL teacher?

Teacher A was an EFL teacher whereas Teacher B was an ESP engineering teacher. These differences might influence the focus of the lesson; while the engineer emphasized the content, the EFL teacher would prefer linguistic items and knowledge.

Table 15

Interviewed ESP Teachers' Demographic Information,

	Questions	Teacher A	Teacher B
a)	Age Category	20-25	35+
b)	Language Teaching Specializations	EFL teacher	Engineering ESP teacher
c)	Teachers' Ranks	Temporary	In-service
d)	ESP Teaching Experience	1 year	5 years

Question 3: Are you an in-service or a temporary teacher?

The profiles of both teachers identified some differences between them. Another disparity emerged from the teachers' positions in the faculty. Teacher A was a temporary teacher with no experience in the field of oil drilling unlike Teacher B who was already in-service.

Question 4: How long have you been teaching ESP?

The interviewed teachers demonstrated dissimilar durations of language teaching. Teacher A was a novice teacher with a humble experience of 1 year. Teacher B taught English there for years along with instructing other modules in the faculty of hydrocarbons.

Section 2: **Teaching Approaches and Content**

Question 5: What suits you better: Teaching the whole batch of students in the same room, organizing them into groups or teaching online? Why?

The participant educators demonstrated distinct attitudes towards teaching approaches. Teacher A preferred in-person instruction delivery combined with dividing learners into small

groups. The aim was “to make studies more successful”. Conversely, Teacher B expressed an inclination for online education, contending that students elicited greater motivation in this modality and guaranteeing the presence of the maximum number.

Question 6: Are your students studying General English or English for Specific Purposes?

As far as English teaching approach was concerned, both participants opted for teaching ESP rather than General English, with a difference in the lessons focus.

Question 7: Does the content of English have relation with the other subject matters of students' specialty?

Regarding the types of English language content or focus, both participants covered an instruction program that was related to their students’ field of study and the objectives set by the department administration. While Teacher A affirmed the necessity of teaching basic language components for discipline use, Teacher B opted for several teaching activities. This included the immersion of the learners into discipline-specific communicative situations with experts in the field of hydrocarbons where technical fluency in expressing professional content was viewed more important than language accuracy. Moreover, Teacher B also used activities depending on translation of texts and technical terms of oil drilling. Furthermore, as a sort of preparing the target students for writing MA dissertation, Teacher B highlighted the importance of training and engaging them in scientific research and publication.

Question 8: How often do you resort to the native language to clarify new items or ideas?

With respect to code switching in the English classes of oil drilling students, Teacher A declared the use of Arabic on certain occasions when introducing new information or details. Teacher B reverted to French rather than Arabic, notably for the explanation of the instructions.

Section 3: Teachers’ Evaluation of Oil Drilling Students

Question 9: How do you evaluate the level of students' readiness and motivation to study English? (Highly motivated – moderately motivated - not interested at all)

With respect to student's motivation towards the sessions of ESP, another disparity emerged between the two instructors. Teacher A found them moderately motivated with observed tendency to skip ESP classes. Teacher B depicted them as highly motivated during the online session as evidenced by increased class participation, compared to conventional sessions featured with high rate of absenteeism and lack of interest.

Question 10: Did your students use to prepare some information for English sessions?

In the context of prior preparation for the ESP classes in oil drilling department, Teacher A declared their tendency of doing preliminary work when they were assigned to. Teacher B affirmed that the students did not prepare for the upcoming ESP sessions as they study online and the session depended on the curriculum provided by the administration.

Section 4: Instructional Materials

Question 11: What instructional materials do you use in the class? (Visual aids, audios, texts, pictures, etc)

As for instructional materials employed in the ESP classes in the target department, the participant educators exhibited contrasting inclinations. Teacher A depended on handouts with illustrative pictures during class time, along with email platform as a channel for communication with learners. Teacher B opted for Google Meet as the platform for facilitating online discussion, lesson presentation and interactive learning. Additionally, Teacher B used Moodle to upload any lessons and educational resources along with a Facebook messenger group to notify students with any updates.

Question 12: Are you using technology in teaching English? In case of 'yes', what types of technology do you use in your classes, and how do you integrate them to accomplish lessons' objectives?

As far as the focus of this study was concerned, this question was asked seeking to understand the situation of technology integration in the ESP classes. As mentioned in the question above, Teacher A relied on email platform beyond the scheduled class time. Teacher B conducted the entire session via digital channels (Google Meet and Facebook Messenger group for sharing any administrative considerations or sessions scheduling).

Question 13: Do you depend on Internet in your lessons?

Both teachers affirmed their dependence on the Internet in their work. This included the design of lessons, search for activities and instructional materials for both of them, sending assignments for Teacher A, and lessons and announcements for teacher B.

Section 5: Types of Learning Activities

Question 14: What are the types of activities and exercises that better motivate your students?

With regard to the learning activities that were opted for by the interviewed teachers as a tool for effectively motivating learners, specific communication-focused ones were mentioned. Teacher A depended on conversations while Teacher B preferred direct live online discussions and tasks based on translation related to technical terms.

Question 15: Do your class tasks provide any opportunities for communication in English?

The participant instructors showed another similarity through highlighting the significance of communication within the English learning process. Teacher A favoured the use of conversations entailing authentic communicative situations related to the field of hydrocarbons. Teacher B emphasized the effectiveness of immersing learners in live online discussions with experts in their field of study.

Question 16: Did you use to provide your students with homework or outside class projects?

With respect to homework and projects as type of learning activities, the participant teachers had varied views. Teacher A assigned some sorts of activities to be done outside class whereas Teacher B did not.

Section 6: Online Education Modalities Employment

Question 17: Did you use new online education modalities such as blended learning and flipped classroom model before Covid-19 pandemic spread?

The adoption of hybrid and online learning in the Algerian higher education was highly related to the emergence of Covid-19. As Teacher A did not experience teaching in the faculty of hydrocarbons before Covid-19, this teacher was then not concerned with this question. Teacher B claimed that moving to total online modality in teaching English was combined with the higher education minister's promotion of English as a language of instruction in all university disciplines in the academic year 2023-2024. During Covid-19 spread, teachers transitioned to using the platform of Moodle and uploaded their courses. On their side, the students signed in with their accounts there, got access and downloaded that available instructional material.

Question 18: Which of the following best describes your teaching practices during Covid-19 pandemic spread? Zoom conferencing and online discussion with students; uploading video and document lectures on digital platforms; In-person short sessions with lecture handouts; Sending courses into students' emails

Again Teacher A was not concerned with the current question for not experiencing teaching in the period of the spread of Covid-19. Teacher B used to upload document lectures on digital platforms, notably Moodle.

Section 7: Assessment Techniques

Question 19: Which of the following techniques do you use to assess students' progress? Tests and exams, comprehension checks, writing tasks, gap fill exercises, oral presentations

With respect to the assessment techniques, Teacher A used comprehension checks and oral presentations during sessions and intended to use a sort of exam or test by the end of the semester. Teacher B used comprehension checks during the sessions and semestrial exams.

Section 8: Teachers' Technological Literacy Level

Question 20: How can you evaluate your technological skills?

The new teaching approaches depend heavily on the mastery of modern technologies. Teacher A claimed possessing "good" technological skills. Teacher B exhibited an "excellent" level of technological literacy, owing to his academic background in engineering and acquaintance to the use of technologies.

Section 9: Students' Challenges with English Proficiency

Question 21: What are the problems facing your students with English language?

Concerning the major language challenges facing learners, Teacher A observed that the main problem rose from "grammar". Teacher B believed that writing was the most critical trouble encountering them.

Question 22: Why do your students face difficulties when learning English?

When learning English, oil drilling students could face some difficulties. Teacher A believed that those problems stemmed from the "little use of English in learners' daily life" as well as the "emphasis on grammar over speaking practice in their experiences with English. Teacher B contended that the causes were rooted in the "lack of exposure to real English speaking situations".

5.2. During Intervention Data Analysis

Depending on the previously presented findings from the needs analysis questionnaire and the ESP teachers' interview, the oil drilling course was designed, and the researchers initiated its implementation in collaboration with ESP teachers. They explained its steps and particularities with regard to the guidelines of the flipped classroom model.

Along the course of this section of the investigation, the analysis focused on two key areas. First, an evaluation and comments on the level of engagement of the learners in achieving the pre-sessions tasks in order to assess the success level of FC in satisfying learners' requirements, and to determine its viability as an effective approach in the Department of Drilling and Mechanics of Oil Fields; second, the analysis of the details recorded from the classroom observation of the face-to-face part of this teaching approach.

The data collection method in the virtual phase was based on the achievement of the Google Forms online tasks, interactions in the discussion posts and sharing content related to the ESP sessions. For the in-class sessions, the criteria of evaluating the success of the session depended on the predefined checklist (Appendix J), shedding the light on both ESP teacher's and students' roles.

The coming report covered the analysis of the data obtained from the observations conducted over two pre-class sessions and three in-class sessions, attended by the researcher.

5.2.1. The Findings of Observing the Pre- and Post-Phases of FCM

The researcher designed pre-class assignments, consisting of tasks coupled with videos related to oil drilling discipline. Both interviewed ESP teachers and surveyed students emphasized the importance of the communicative aspect. Those tasks were sent via emails to the participant students to be performed. The following criteria were taken into consideration to assess FC efficiency in this field of study:

a) **Quality of the Course Instructional Materials and Activities**

The researcher opted for the use of videos in both pre-sessions allowing the study participants to learn at their own pace. The learners were familiar to instructions of the tasks (Giving title to the video, True/False, Answering the questions).

The overwhelming majority of tasks provided options to select from, rather than requiring learners to generate their own free responses. This was due to the following reasons: First, the options aimed to ease the learners' mission of constructing answers; second, they enhanced students' comprehension skills through enabling them to identify their own misconceptions or areas of confusion in the pre-class content; third, the multiple-choice questions would be less intimidating for some students, and hence, build their confidence and maximize engagement with the pre-class material; lastly, the aim of the researcher was to evaluate the extent of learners' engagement and interest in the online sessions rather than emphasizing the correctness of the provided answers.

By the end of the first face-to-face session, the ESP teacher provided teamwork to be achieved and shared on the messenger group created by the ESP teacher. The task involved the learners into self-directed written production about a topic entailing comparison of content aspects in their field of study.

b) Students' Interaction and Engagement

Table 16

Students' Engagement in Pre-Session Assignments

	Number of submitted answers	Frequency
Pre-session 1	5/31	16.13%
Pre-session 2	4/31	12.9%

The analysis of the findings focused on the notably low participation rates of students in each session and the comparison of these rates between the two sessions. In the first pre-

class online session, the email was sent to the sample members. 5 out of 31 participants submitted their replies to the tasks. Almost all answers were correct which meant that the participants watched the video before doing the tasks. However, the answers represented a significantly low percentage (16.13%) of learners' participation.

Concerning the students' engagement in the second pre-session, the rate even declined with the withdrawal of one participant. The received replies were 4 out of a total of 31 study participants. The frequency became 12.9%. Even worse, one of the 4 respondents answered only one question appropriately and replied with a dot "." for all other questions.

In the post-class phase, two groups, one with two members and the other with four, shared their written production on Messenger group to their mates. However, no further questions were raised for any clarifications, explanations or feedback.

5.2.2. Analysis of Recorded In-Class Observations

The FCM has revolutionized the definition of classroom observation. It was only matched to the researchers' recording of any details taking place during the conventional face-to-face presence of students with their teacher in a physical room, depending on the focus of the study. With the advent of FCM, it is important to differentiate the observations gathered from the online pre-class and post-class activities on one hand and those made during in-class time frame on the other. The data collected from the first type were previously analyzed and presented. In the coming passages, we analyzed and commented on the recorded data from the second type of observations. They were classified in the checklist according to the key components of the flipped classroom model.

- **Warm-up:** The ESP teacher opted for directly starting the lesson. Neither quizzes nor summary of the pre-class covered content were tackled due to the students' lack of engagement with the pre-sessions digital materials (videos and learning activities).

- **Teacher-student interaction during in-class phase:** The predominant teaching approach was student-centered. The ESP instructor depended on the designed lesson plan. Instructing students to perform hands-on activities, extending involvement to passive learners via pointing to them to read the texts or write the typical answers on the board were prevailing practices. These practices took a substantial amount of the total instructional time. The criteria of peer-to-peer question-answer were not observed.

  Attempts on the part of the participating learners to refine their pronunciation while providing the answers to the activities or reading the texts were observed in all the answers (100%). Learners displayed shy tendencies with a frequency by at least 50% among the respondents during the answering portion. This was noted in their reluctance to take part in the classroom activities and their soft-spoken manner when participating.

  Disappointingly, a minority of learners demonstrated a willingness to study and showed a high level of engagement during the session. Problematically, there was a group of students who exhibited a deficiency in personal responsibility, frequently disrupting the learning environment through making noise.

- **Classroom instructional practices:** The classroom practices appeared in the frequencies of their occurrence during the in-class time of one hour and half:
  - The ESP teacher kept an adequate lesson pace: ongoing;
  - Employing digital tools such as encouraging students to rely on dictionaries and AI-tools: ongoing;
  - Clarifying instructions to students: 0 times
  - Providing enrichment and remediation where required: Only after incorrect or inconvenient answers.
  - Checking interest and attention through observation of students' body language and level of participation, as well as by asking questions: After reading each paragraph

through asking about the central idea or the main ideas in a text and also pre or during the performance of each activity, or in times of correcting peers' answers.

* Devoting enough time to discussion: Satisfactory

– **Learning Activities**

With respect to the in-class learning activities, a qualitative descriptive approach was used to evaluate their convenience level after putting them into practice according to the criteria in the observation checklist.

Table 17

In-Class Learning Activities Evaluation

Learning Activities	**Qualitative Descriptions**
Tasks are related to oil drilling specialty	Strongly aligned with the oil drilling specialty.
Related to learners' needs	Highly convenient
Suitable to learners' level	Highly suitable
Involving	Reasonably involving
Use logical and thought-provoking questions	Highly Convenient

There was an alignment of the activities with the content of the learners' specialty. Session one tackled activities related to oil products types, uses and properties. It depended heavily on comparative analysis of the oil products and a concise and organized presentation of the information in a table. Session two covered the different job opportunities available in the oil and gas industry (variety of jobs such as apprentice, technologist, engineer, etc; the qualifications and requirements for different roles e.g. physical strength, academic qualifications, in addition to the outdoor or onsite work of nature of the work).

The questions and prompts used were generally logical and thought-provoking, contributing to a high level of convenience. They were also suitable to learners' level as there

were no questions to clarify instruction or any other detail in the lesson on the learners' side while the provided answers were almost all correct.

Additionally, the learning activities were convenient to the learners of oil drilling needs mainly because they were based on mobilizing learners' prior knowledge and skills with a bit of challenge in the language, rather than wasting time on redundant content they already know. Furthermore, the qualitative insights gained through learners' comments of "this is what we need, not those beginner-oriented worksheets and tasks".

The activities were reasonably involving for the participants as they enhanced the quality of engagement of the interested learners compared to the conventional session according to the comment of the teacher. With respect to the use of logical and thought-provoking questions, the activities were evaluated as highly convenient as the participating learners demonstrated deep understanding of the texts content through providing thoughtful and complex responses. An instance of these observations included the learners' ability to deduce details from the text related to the characteristics and uses of different types of oil products and easily determine the nature of each element.

Evaluation of Students' Performance vis-à-vis 21st Century Skills

By shifting to the flipped classroom model, the aim is to focus on active engagement and overcome the passive learning obstacles. This relies on enabling students to practice critical thinking, problem-solving, collaboration, and other fundamental skills empowering them to be successful in the 21st-century professional and technology-driven society.

With regard to these skills, we observed the realized instances of learners exhibiting these 21st century skill proficiencies. Drawing from the observed data, only a small rate of learners showed readiness to work collaboratively in groups to achieve shared goals during post-class phase. An instance was attached in *Appendix N* where two groups of students,

consisting of 2 and 4 students respectively, solved the existing problem in the task. They shared their work in front of the class in the following session.

This task also reflected the use of critical thinking skill in comparing two types of engines and highlighting their advantages and disadvantages and determining the most suitable of them for daily use (decision-making). The same task, on another side, was a concrete example of engaging in discussion within the group and communicating findings to the class.

Digital literacy skills were also required to synthesize details about those engines. In a nutshell and within the short course of the current study, the 21st-century skills were evidently there and were manifested by the most engaged learners in the classroom.

– **Students' Production Types**

The most enthusiastic and dedicated students of the class exhibited a potential ability in understanding technical terms and meaning of academic texts related to oil drilling. The texts used during the in-class sessions were taken from the original sources without any modifications, though they were directed to advanced English learners. However, due to the limited timeframe of the investigation, the learners' productive skills were limited to providing direct oral or written answers to the assigned tasks, with less opportunity to demonstrate competencies in more specialized industry genres, such as creating CVs, producing well-structured formal reports, conducting telephone conversations, negotiating new businesses or contracts for the company in real-like meetings, etc.

– **Effectiveness of the Lessons**

The lessons addressed in class did not show clear alignment with the preparatory digital materials. Additionally, the course failed to engage all or at least most of the learners to take part in the course of the lessons, which was one of the fundamental goals of adopting the FCM in this study. This was observed in the persistent hesitation and shyness of the

participating learners, particularly in response to the negative gestures (mainly laughs) made by their classmates on their performance.

Likewise, we observed a continuous insistence on perfect pronunciation while replying to questions and made it an obstacle for efficient learning. Addressing this issue, the marked lack of student involvement prompted the teacher's decision to randomly calling on learners, most of whom knew the correct answers and demonstrated satisfactory pronunciation.

Furthering this point, while there were instances of collective responses or individual contributions without raising hands, the teacher’s request for individual responses following a raised hand protocol elicited greatly low or no participation. Another group of learners were totally calm receptive since the beginning of the course.

Another shortcoming was the students' apparent failure to integrate the previously received digital content of the pre-session and using it during the in-class time. This was noticed from the disconnection between the pre-session covered content and their actual in-class contributions.

Significantly, another group of students maintained a passive position throughout the observed sessions, characterized by an absence of noise, participation, and singular or collective contributions. We were unable to determine the underlying causes behind that. This could be due to a lack of interest or understanding, shyness, inadequate preparation, preference for passive learning, discomfort with the learning atmosphere, or any other factors.

Turning our attention to the advantageous elements evident in the course, however, the observed sessions showed that the presented lessons increased enthusiasm among the classroom's most engaged and committed participants. It provided opportunities to reflect on their own learning through teacher’s constant checks on whether the tasks and information

were unambiguous and comprehensible on one hand and learners' articulation of their understanding via again a tiny minority's reply with "yes".

The delivered lessons also showed other strength points. First, it was noted the appropriate allocation of time to address each of the prepared activities with smooth transition between them. Second, the delivered activities also had diversified types, ranging from identifying the appropriate technical terms matched to definitions, to discussing with arguments the advantages and disadvantages of tools used in oil drilling fields, etc.

Highlighting the positive attributes that characterized the delivery of this lesson, its learning objectives were clearly communicated, departing from the titles of the texts to their content and the accompanying tasks. Taking the first lesson as an instance, it aimed to compare and contrast the features of oil company products while the second lesson's objectives were to identify job categories, key roles, and required qualifications aligning with specific job opportunities there.

Concentrating our analysis on the praiseworthy qualities of the used instructional materials, the ESP teacher depended heavily on handouts with legible font size, clear layout, visuals supported the understanding and free from errors. Additionally, the handouts provided the necessary information, instructions, and practice opportunities assisting students to fulfill the predefined learning goals.

5.3. Post-Intervention Data Analysis

The current study consisted of a preliminary attempt understanding and description of the setting, identifying learners' needs and ESP teachers' provided data about teaching ESP in the Department of Drilling and Mechanics of Oil Fields. Drawing from the insights gained from conducting the pre-study research tools (Oil drilling Master 1 students' questionnaire and ESP teachers' interview along with a content analysis of the syllabus provided by the department for the teachers' to be developed according to their own efforts), the ESP flipped course was

designed and implemented. A classroom observation was conducted and its findings were integrated with the post study questionnaire of oil drilling students and interview of ESP teachers to determine whether the course was effective.

In the coming sections, the analysis of the oil drilling student questionnaire came in the first place, then it was followed by an investigation of the ESP teachers' interview outcomes. The findings of these research instruments were expected to exhibit insights about learners' and teachers' attitudes towards learning English in the setting of hydrocarbons and the integration of technologies and modern teaching approaches.

5.3.1. Findings of the Post-Study Student Questionnaire

Section 1: Informed Consent

1) I agree to participate in this study

The sample, who received the post-study questionnaire, consisted of the same students of the pre-intervention stage. It comprised 31 students. They were also observed during the in-person sessions and their online contributions were analyzed. However, only 21 oil drilling students granted their approval to respond to the post study questionnaire.

Section 2: Online Learning Experience and Engagement

In this section, the collected data described the questionnaire respondents' perceptions of key aspects of the FCM, aligning with this various questionnaire's questions/statements. The findings of the questionnaire elements 2 to 8, consisting of percentages and frequencies, were organized and summarized in a table format allowing efficient data presentation and facilitation of readability and comprehension

Table 18

Students' Perceptions of FCM Aspects

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1) Videos and Digital Activities Impact on Lesson	0	2	3	12	4

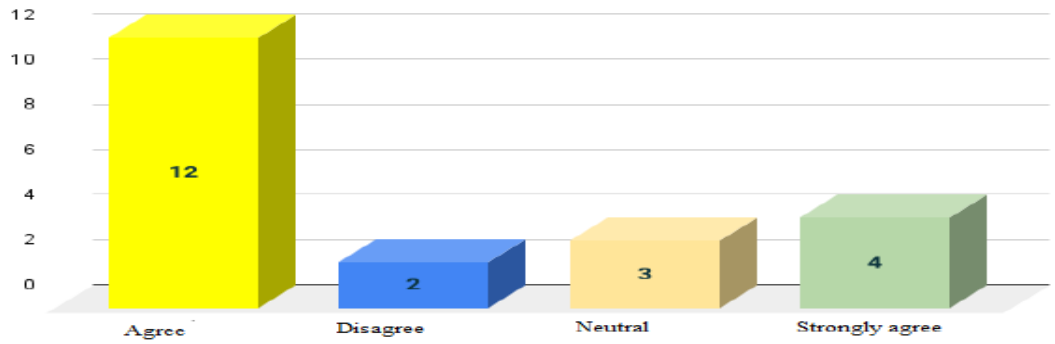
Understanding	0%	9.5%	14.3%	57.1%	19%
2) Pre-Class Activities' Positive Impact on In-Class Practice	0 0%	2 9.5%	5 23.8%	11 52.4%	3 14.3%
3) Online Materials Access' Impact on Self-Paced and Flexible Learning	0 0%	1 4.8%	3 14.3%	14 66.7%	3 14.3%
4)FCM's Impact on Enhancing Students' Course Content Understanding and Retention	2 9.5%	2 9.5%	4 19%	8 38.1%	5 23.8%
5) Pre-Class Online Phase's Impact on Reducing Learning Boredom and Pressure	0 0%	0 0%	3 14.3%	12 57.1%	6 28.6%
6) Application of Pre-Class Knowledge into Students' Educational Discipline	0 0%	0 0%	5 23.8%	14 66.7%	2 9.5%
7) Enhanced Interaction and Feedback Potential via Online Learning	0 0%	1 4.8%	3 14.3%	16 76.2%	1 4.8%

Please rate the following statements based on your experience in the flipped English course:

1) **The video lectures and online materials greatly contributed to my understanding of the course content. -Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree**

Figure 336

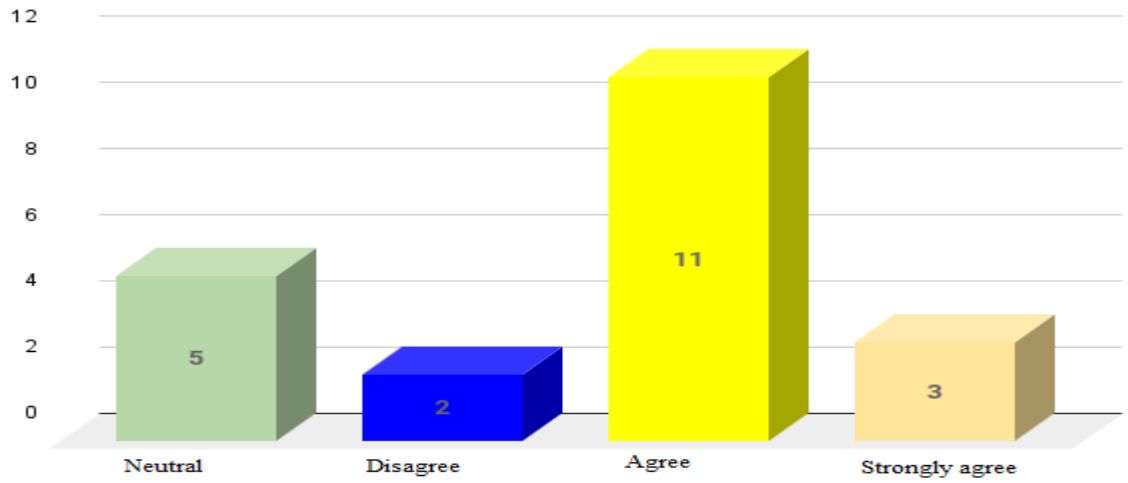
Evaluation of Videos and Online Activities Impact on Lessons Understanding



The respondents overwhelmingly agreed upon the positive support of the video lectures and digital materials during the pre-class FC phase of their learning of ESP, and hence their self-learning. This agreement was reflected in an inclination of the responses towards “Agree option” with a proportion of 57.1% and “Strongly agree” reflected in 19%. A minority of 14.3% of the data providers chose to be neutral while the smallest percentage of 9.5% was that related to “Disagree” option.

Figure 347

Pre-Class Activities’ Positive Impact on In-Class Practice



2) **In-class activities and discussions were enhanced by practical application of pre-session learning materials.- Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree**

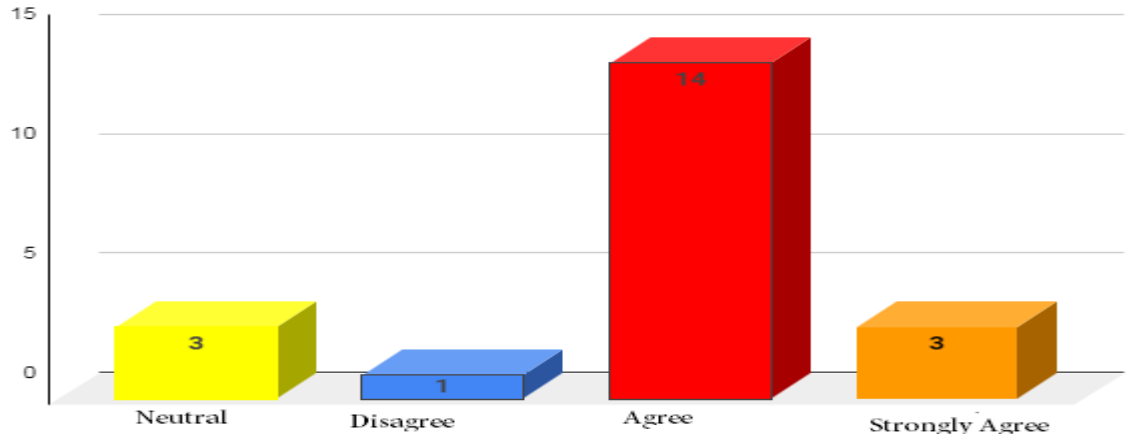
With respect to the effect of pre-class phase on the quality of in-class practice, the response distribution inclined towards agreement (14 out of 21) about their positive effect with a proportion of 52.4% for ‘Agree’ and 14.3% for ‘Strongly agree’. A small number (5 out of 21) represented with a percentage of 23.8% demonstrated uncertainty on the impact of pre-class work. A minority (2) constituted of 9.5% indicated that pre-class work could not be depended on for boosting in-class engagement.

3) **Online access to course materials offered the freedom to learn at one's preferred pace and review content as needed.- Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree**

The findings showed an inclination of the data distribution towards the agreement side supporting the view that the access to digital materials assisted self-paced and flexible learning. This was represented by a significant majority of 66.67% (14 out of 21) for 'Agree' and 14.29% (3 out of 21) for 'Strongly agree'. This was followed by a percentage of 14.29% (3 out of 21) for the respondents who maintained a neutral stance on this matter. A negligible minority of 4.76% (1 out of 21) believed that online resources positively affect students' style of learning.

Figure 358

Online Materials Access' Impact on Self-Paced and Flexible Learning



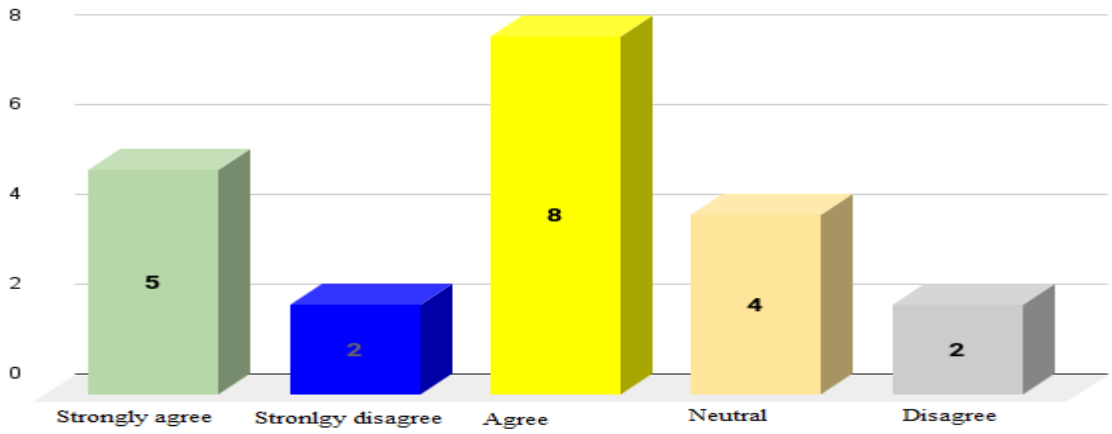
4) **Flipped Classroom Model deepened my comprehension and ability to remember the course content compared to traditional teaching methods- Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree**

Compared to the traditional teaching methods, FCM was found to be effective in improving the course content comprehension and retention with a significant majority of 61.9% of the total respondents divided between 'Agree' (38.1% consisting of 8 out of 21) and

'Strongly agree' (23.8% representing 5 respondents). 19% of respondents (4 out of 21) kept neutral stance on this issue. An equivalent percentage of 9.5% appeared for each of 'Disagree 'and 'Strongly disagree' options, indicating that FCM could not lead to improved learners' understanding and memorization of the course content in oil drilling discipline.

Figure 369

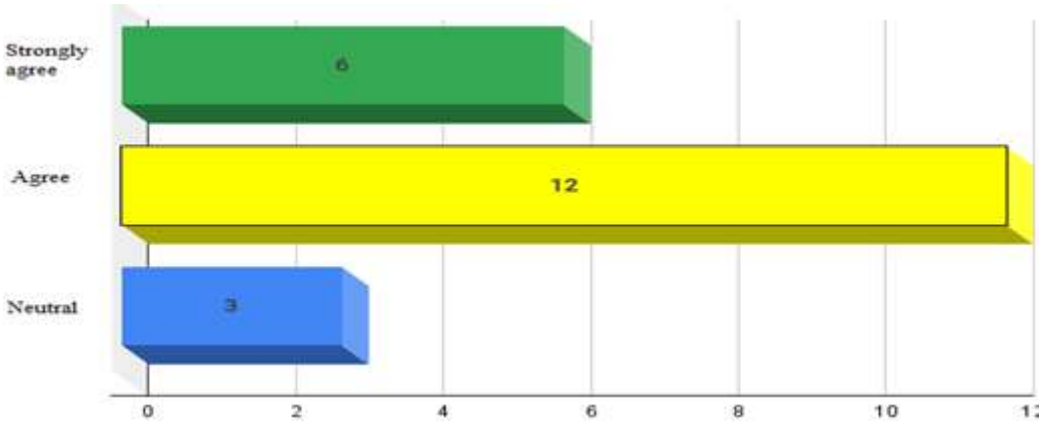
FCM Impact on Enhancing Students' Course Content Understanding and Retention



5) Online learning approach reduced the feeling of boredom and pressure of studies. - Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

Figure 50

Pre-Class Online Phase's Impact on Reducing Learning Boredom and Pressure



A considerable share of the respondents comprising a percentage of 84.7% accounted for supporting the belief that online learning environment assisted at lowering their levels of

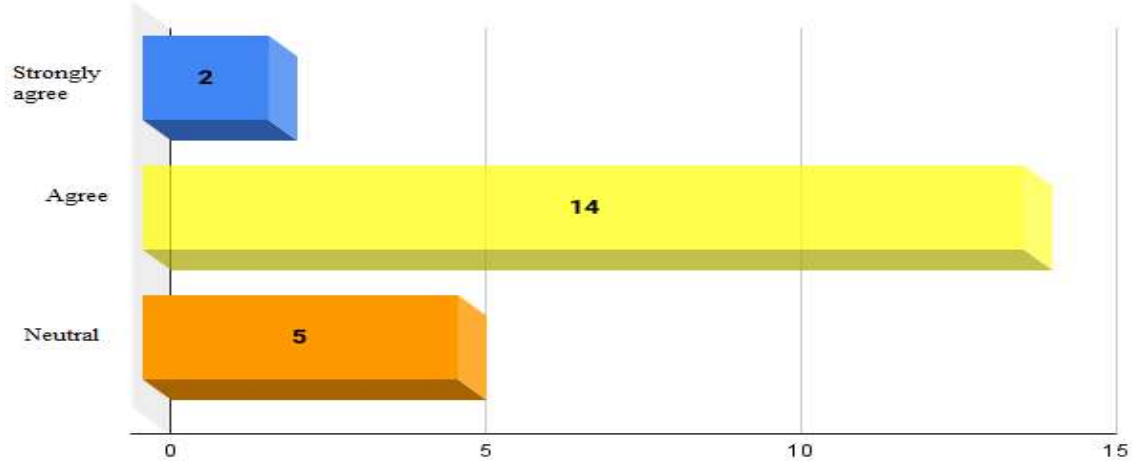
boredom and academic stress. This portion was divided between 'Agree' option with 57.1% (12 out of 21) and 'Strongly Agree' with 28.6% (6 out of 21). 14.3% of respondents (3 out of 21) expressed a neutral perspective on the subject. Absolutely no respondents viewed online phase of FCM as having no impact on or increasing boredom and pressure of studies.

6) **I was able to apply the knowledge and skills learned in the online sessions to real-life situations in my field of study. -Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree**

According to the results, the data distribution revealed a high inclination towards students' agreement about their ability to actively use the learned knowledge and skills in authentic, meaningful situations related to their academic discipline. This was reflected in 9.5% (2 out of 21) of the respondents for 'Strongly agree' and 66.7% (14 out of 21) for 'Agree'. Neutral responses accounted for 23.8% (5 out of 21) of the total number of respondents. Besides, there were no instances of disagreement among the individuals who provided feedback.

Figure 51

Application of Pre-Class Knowledge into Students' Educational Discipline

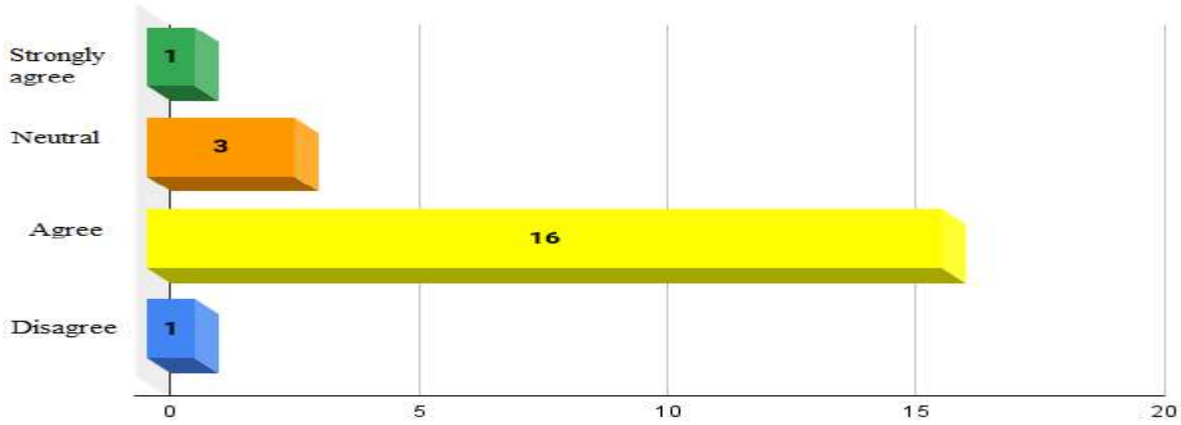


7) **You have sufficient opportunities for interaction, questions and feedback during the online sessions. -Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree**

The lion's share, at 84 % of the total respondents (15 out of 21) affirmed that online education provided a sufficient deal of interaction during English sessions as well as opportunities for ESP teacher's feedback, with a bit different degree of agreement (76.2% for 'Strongly agree' and 4.8% for 'Agree'. Neutral responses accounted for 14.3% of the individuals who provided feedback. Only a marginal fraction of 4.8% (1 respondent for 'Disagree') exhibited opposition to this particular issue.

Figure 372

Enhanced Interaction and Feedback Potential via Online Learning



Section 3: Effectiveness of FC Digital Phase

8) **How effective was the Flipped Classroom approach in improving your engagement and participation in the English course? - Very Ineffective | Ineffective | Neutral | Effective | Very Effective**

Regarding the effectiveness of the pre-class phase of FCM in enhancing learners' engagement and participation in the learning activities and class interactions, the vast majority, amounting to 71.4 % of all respondents (15 out of 21), indicated their affirmation. Additionally, 14.3% (3 out of 21) found it highly effective. 9.5% of the participants (2 out of 21) viewed this phase as 'Moderately Effective' while 4.8% assessed it as (1 out of 21) 'Slightly effective' in achieving the target goal. Moreover, not a single respondent evaluated

pre-class stage as ‘Not effective’. Table 19 and Figure 53 served as a concise summary of the key data.

Table 19

Effectiveness of Pre-Class Phase in Enhancing Class Participation

	Frequency	Percent
Not effective	0	0%
Slightly effective	1	4,8
Moderately effective	2	9,5
Effective	15	71,4
Highly effective	3	14,3
Total	21	100,0

Section 4: Challenges in Virtual Stages of FCM

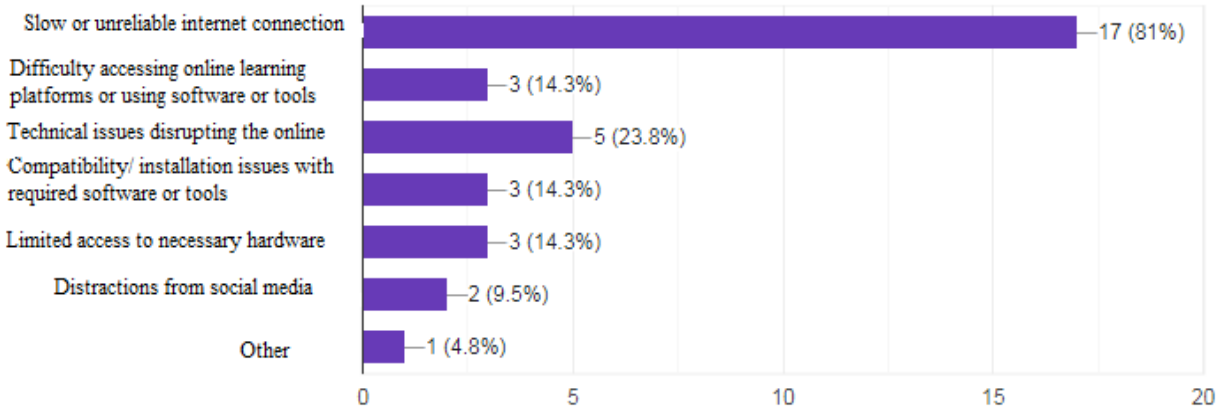
9) What challenges did you face during the online phases of FCM?

In this checkbox-style question, the lion's share, at 81% of the total responses with a frequency of 17, were confronted by slow or unreliable internet connection as the most crucial challenge during the online pre and post stages. A frequency of 3 responses, represented by a percentage of 14.3%, was attributed to difficulty in accessing online learning platforms or using software or tools, such as unfamiliarity with Google Meet features, activating the camera and microphone, etc. 5 responses, equating to 23.8% of the total, opted for problems with technical troubles disrupting the online learning experience (e.g. audio/video problems, screen freezing). An equal percentage went to the limited access to necessary hardware (e.g., computer, microphone, and webcam) as well as the compatibility or installation difficulties with required software or tools. These two elements were reported in 3 responses, comprising 14.3% of the total, for each of them. 2 respondents, making up 9.5% of the total, mentioned challenges related to their inability to avoid distractions from social media (e.g. Facebook, Telegram) and other online activities unassociated with the online session of English.

Absolutely no respondents were confronted with difficulties in navigating or understanding the online learning interface. Only one respondent chose 'Other' option with a percentage of 4.8% of the total responses, but without specifying the nature of those other challenges.

Figure 383

Challenges faced during the online phases of FCM



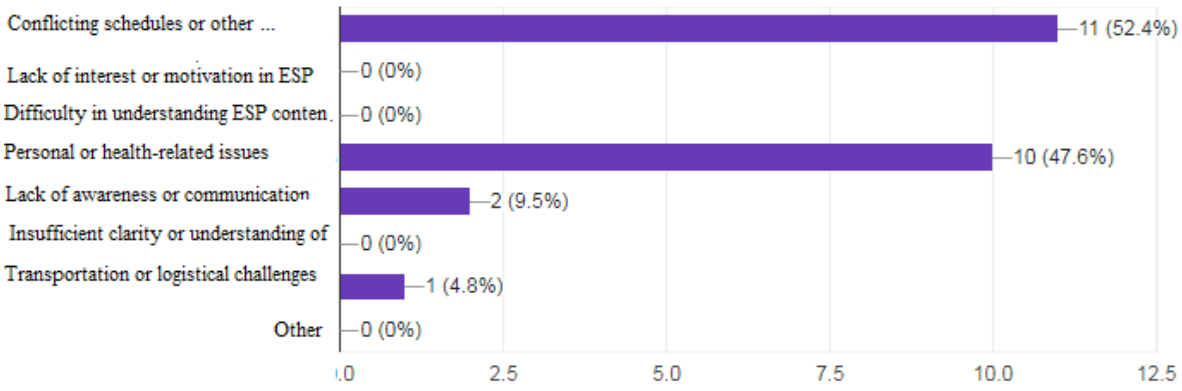
10) **As a student, which of the following reasons could contribute to your lack of presence in face-to-face English sessions? Please select all applicable options**.

For this question presented with checkboxes, conflicting schedules or other commitments with the session of ESP took the lion's share as a reason for the times of absenteeism from in-person sessions of ESP with a percentage of 52.4% and frequency of 11 of all responses. The second major reason was personal or health-related issues affecting attendance. The respondents highlighted it by 47.6% of the overall feedback received on this matter, reflected in a frequency of 10 responses. A small minority of the sample, consisting of 9.5% with a frequency of 2 responses, opted for the lack of awareness or communication about the benefits of face-to-face interactions as one of the reasons of students' absence. Transportation or logistical challenges for attending the in-person sessions was referred to by only one respondent with a proportion of 4.8%. In addition, not even one respondent identified the following elements as being causes of physical classes' absenteeism: lack of interest or motivation in the ESP subject matter, insufficient clarity or understanding of the

expectations for participation, and difficulty in understanding the relevance or applicability of the ESP content. Likewise, the option 'Other' was not chosen by any of the research participants.

Figure 394

Reasons for In-Person Sessions' Absenteeism



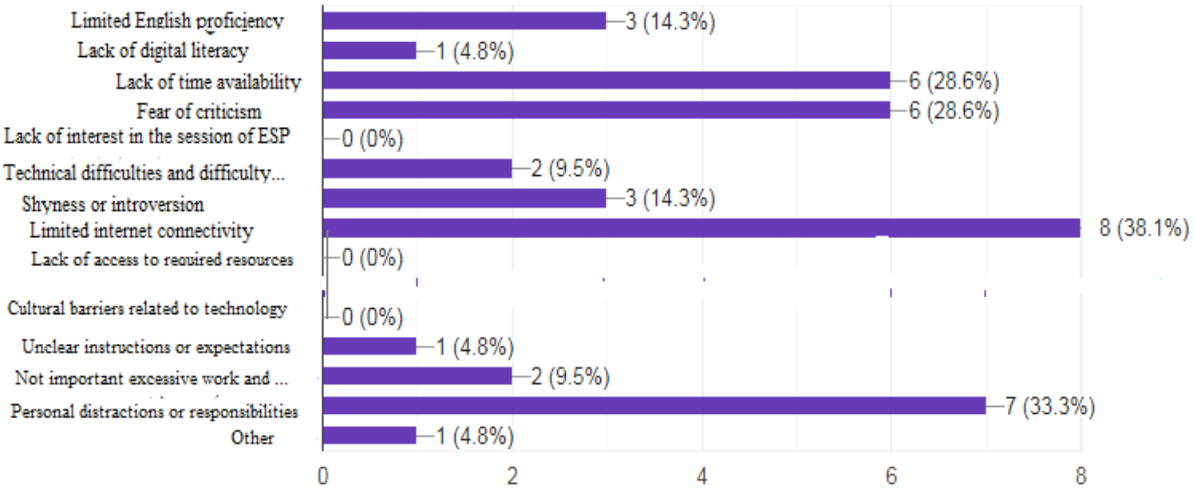
11) What factors contributed to your lack of participation in online English activities?

With respect to the factors leading to the low level of respondents' engagement in the pre and post class online activities, a sizable 38.1% (8 out of 21) of the overall respondents opted for limited internet connectivity as a primary criterion. This was followed by personal distractions or responsibilities with a percentage of 33.3% of the participants, amounting of 7 respondents. This element was supported by the choice of the lack of time availability accounting for a percentage of 28.6% of the total respondents (6 out of 21). A similar percentage was recorded for fear of criticism. Limited English proficiency coupled with the factor of shyness or introversion accounted for a proportion of 14.3%, with a small frequency of 3 of the total responses, for each of the questionnaire elements. Both technical challenges and difficulty accessing the digital content as well as an excessive workload and unnecessary activities separately made up 9.5% of the total responses, with a minor frequency of 2 for each of the two questionnaire component. Each of the lack of digital literacy, ambiguity of

instructions or their objectives and the option 'Other' scored a negligible proportion of 4.8% (1 out of 21). Not a single one of the respondents opted for one of the coming elements as restricting factors for their engagement in online ESP activities: Cultural barriers related to tech use, lack of access to required resources and lack of interest in the session of English,

Figure 405

Factors Contributing to the Lack of Participation in Online English Activities



Section 5: Motivation and Engagement with Pre-Class Assignments

12) Were you motivated to prepare adequately at home before each English in-class session?

The collected data for this question revealed that a sizable majority of 42.9% (9 out of 21) of the total respondents considered their motivation to prepare for the in-class session as 'Moderately effective' when allocating it enough time. 33.3% (7 out of 21) viewed their readiness as 'Ineffective' due to their inability to devote enough time for such pre-class work. A marginal minority of 3 respondents, accounting for 14.3% of the overall respondents regarded their preparedness as 'Very effective'. The rest percentage of the overall respondents, consisting of 9.5% (2 out of 21) did not prepare at all as they had no access to pre-class assignments.

Table 20

Learners' Motivation for Pre-physical Class Preparation

	Frequency	Percent
Ineffectively- I struggled to allocate enough time and often came unprepared.	7	33,3
Very effectively - I consistently allocated sufficient time and came well-prepared	3	14,3
Moderately effective - I usually allocated enough time and came adequately prepared.	9	42,9
Insufficient access - I did not have adequate access to pre-class assignments	2	9,5
Total	21	100

13) Did you complete the pre-class assignments sent via email?

With respect to the level of completion of pre-class activities, 38.1% (8 out of 21) of the respondents completed most of them. 23.8% (5 out of 21) of the data providers did not participate at all in the pre-class phase and hence did not perform those tasks. 14.3% (3 out of 21) of the subjects did not achieve any of the activities while another similar proportion completed only some of them. A marginal minority of 9.5% (2 out of 21) represented those who achieved all the activities.

Table 21

Evaluating Achievement in Pre-Class Activities

	Frequency	Percent
No, I didn't complete any of them despite reviewing them	3	14,3
Not applicable – I didn't participate at all	5	23,8
Yes, I completed some of them.	3	14,3
Yes, I completed most of them.	8	38,1
Yes, I completed them all	2	9,5
Total	21	100,0

14) In times you did not complete the online assignments, what was the reason?

Table 22

Factors Causing Non-Completion of Pre-Class Online Activities

	Frequency	Percent
The Internet was not available	12	57,1
You did not understand the assignments' instruction	5	23,8
You did not possess any technological device such as a computer or a Smartphone	3	14,3
You had no interest in English session	1	4,8
Total	21	100,0

The observed lack of performing the assignments sent via learners' emails the pre-class time required an understanding of the causing factors. 57.1 % of the overall respondents (12 out of 21) determined the unavailability of the Internet as the main reason for their disengagement with pre-class tasks achievement.

The inability to understand the assignments' instruction came in the second rank with a percentage of 23.8% (5 out of 21). The unavailability of any technological device such as a computer or a Smartphone deemed to be in the third position with a proportion of 14.3% (3out of 21). Having no interest in English session was assessed as a minor barrier for the completion of the online tasks with a percentage of 4.8% (1 out of 21). Not even one of the respondents referred to the online assignments as a boring additional worthless work.

15) Did you find it challenging to take responsibility for your own learning and engage with pre-class online activities without any assistance?

The majority, making up 57.1% (12 out of 21) of the overall respondents, occasionally encountered difficulties to undertake virtual tasks independently. 28.6% (6 out of 21) of the participants regarded online autonomous learning as posing no impediment. A minority of 14.3%, representing 3 respondents, considered this issue of significant hardship.

Table 23

Evaluation of Autonomous Completion of Online Activities

	Frequency	Percent
Sometimes, I found it challenging	12	57,1
No, I did not find it challenging	6	28,6
Yes, I found it challenging	3	14,3
Total	21	100,0

Section 6: In-Class Participation and Time Management

16) **Did you feel comfortable participating in the in-class activities and discussions during the English session?**

Table 24

In-Class Phase Positive Atmosphere for Discussion and Learning

	Frequency	Percent
Sometimes, I felt comfortable.	7	33,3
No, I did not feel comfortable because I found the atmosphere to be intimidating or unwelcoming.	2	9,5
Yes, I felt comfortable participating because the classroom environment was inclusive and welcoming.	12	57,1
Total	21	100,0

With regard to the in-class phase of FC, a considerable share of the respondents accounting for 57.1% (12 out of 21) of the overall participants depicted the discussion and learning atmosphere as inclusive and welcoming. However, this comfort was felt only sometimes by a significant percentage of 33.3% (7 out 21). A small minority of 9.5% of the respondents (2 out of 21) reported their feeling of discomfort due to the unfriendly or discouraging environment. The option suggesting learners' absence during the in-class ESP sessions were not selected by any of the respondents.

17) Did you feel that the available in-class time was sufficient to adequately cover the necessary content and would help you become proficient in English?

The findings in the table indicated that a sizable percentage of 42.9% (9 out of 21) of the total participants determined that the in-class time adequately covered the necessary content for proficiency in English related to their field of study. However, the opposite opinion ranked immediately after the previously mentioned stance with a significant portion of 33.3% (7 out of 21) respondents. A smaller subset of 19% (4 out of 21) took a moderate position, expressing that the in-class time only partially addressed the content required for achieving proficiency. Only a single participant expressed uncertainty about this issue due to a lack of motivation towards developing proficiency in English.

Table 25

Sufficient Time Allocation for Covering the Course's Content and Mastery

	Frequency	Percent
Somewhat, the in-class time partially covered the necessary content for proficiency.	4	19,0+
No, the in-class time did not sufficiently cover the necessary content for proficiency.	7	33,3
Uncertain- I am not interested in being proficient in English	1	4,8
Yes, the in-class time adequately covered the necessary content for proficiency.	9	42,9
Total	21	100,0

Section 7: Instructor's Support and Guidance

18) Did the instructor provide appropriate support and guidance during the online sessions?

Evaluating the role of the ESP teacher, a significant majority of 61.9% (13 out of 21) of the overall participants considered that the ESP teacher's guidance and support were valuable.

28.6% (6 out 21) of the respondents inclined towards a moderate position regarding this matter. One respondent (4.8%) assessed the instructor's support fell short of expectations or needs. A single participant expressed uncertainty about the ESP teacher's role during the implementation of the study intervention.

Table 26

Level of ESP Teacher's Support and Guidance during the Implementation of the Course

	Frequency	Percent
Instructor's assistance was moderately suitable	6	28,6
Uncertain. I did not participate during English sessions	1	4,8
No, instructor's support fell short of expectations.	1	4,8
Yes, the instructor provided valuable support and guidance.	13	61,9
Total	21	100,0

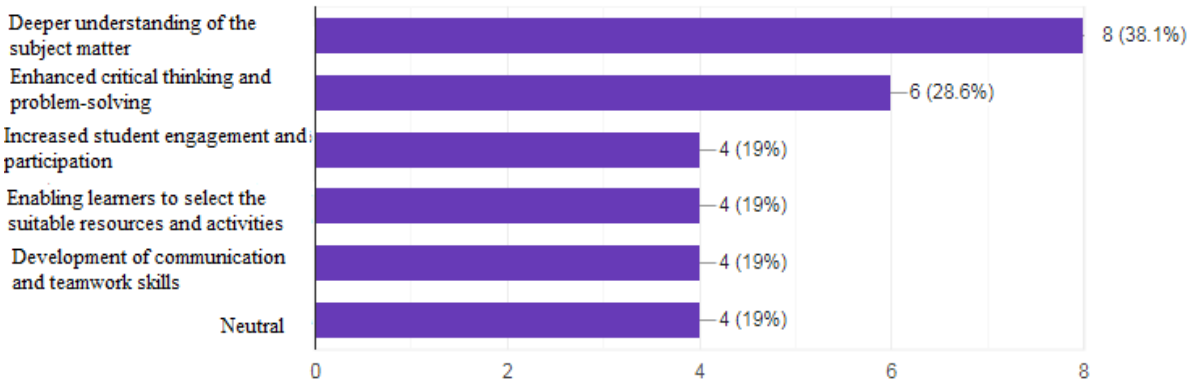
Section 8: Skills Development and Application

19) What specific aspects of Flipped Classroom approach did you find most beneficial?

The researcher proposed a list of the main advantages of FCM for the participants to select from. A significant majority (8 making up 38.1%) of the respondents stated that it helped 'deeper understanding of the subject matter'. A percentage of 28.6% (6 out of 21) saw FCM as having a role in 'enhancing critical thinking and problem-solving skills'. 19% (4 out of 21) of the total respondents was recorded for each of the following features suggesting that FCM 'increased students' engagement and participation', 'enabled them to select the suitable resources and activities meet their needs and skills and develop their language', 'developed their communication and collaborative skills', along with the 'Neutral' position. However, not a single respondent claimed that the provided options were 'not applicable' to their status due to their absence from English sessions.

Figure 56

Participants' Feedback on Perceived Advantages of the FCM



20) During the online phase of English sessions, were you able to actively participate and collaborate with fellow students to enhance your learning experience?

Regarding collaborative peer work, a significant portion of 38.1% (8 out of 21) of the respondents affirmed that there were enough opportunities encouraging such type of learning during the online phase of FC. Yet, the opposite stance gained a lesser percentage of 23.8% (5 out of 21), seeing no opportunities to make them engaged in collective works. A moderate viewpoint for this issue scored 28.6% (6 out of 21), meaning that the balance of the responses inclined towards the existence of such opportunities. Only 2 respondents (9.5%) opted for a neutral response when questioned about this issue.

Table 27

Peer Collaboration Opportunities during FC Online Phase

	Frequency	Percent
Partially, some opportunities were available	6	28,6
No, opportunities were insufficient.	5	23,8
Neutral	2	9,5
Yes, ample opportunities were provided.	8	38,1
Total	21	100,0

21) Were you able to apply the acquired skills in practical situations related to your field of study such as communicating in English with experts in hydrocarbons?

A significant majority of the respondents accounting for 52.4% (11 out of 21) of the total contended that they were able to apply the acquired skills effectively. In the same vein, a portion of 28.6% (6 out of 21) integrated only some of the acquired skills, but not in a regular way. A tiny minority of 2 participants, making up 9.5%, expressed their inability to implement those skills in practical situations related to their field of study. A single respondent believed that there were limited opportunities to apply the acquired skills. One respondent affirmed they could not answer the question due to their disengagement in authentic situations necessitating communication.

Table 28

Acquired Skills Application to Oil Drilling Real Communicative Situations

	Frequency	Percent
I had limited opportunities to apply the acquired skills	1	4,8
No, I was unable to apply the acquired skills in practical situations	2	9,5
Not applicable. I did not participate	1	4,8
Yes, I was able to apply the acquired skills effectively.	11	52,4
I was able to apply some of the acquired skills, but not consistently.	6	28,6
Total	21	100,0

Section 9: Overall Satisfaction towards Course Relevance

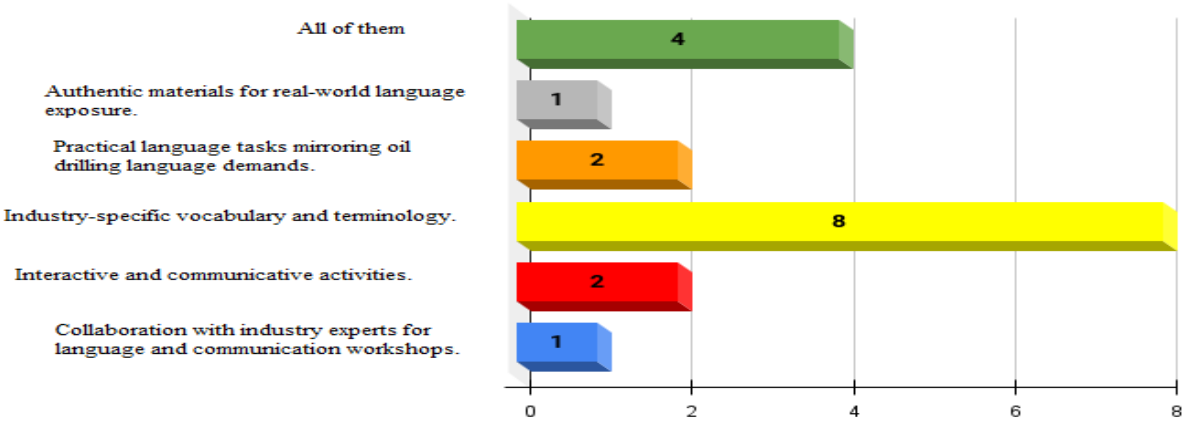
22) Among the following FCM characteristics, which one is the most prominent in the presented lessons- virtual and in-presence?

Regarding the most prominent aspects in ESP classes when implementing FCM, 38.1% (8 out of 21) of the participants set ‘industry-specific vocabulary and terminology’ in the first rank. 19% (4 out of 21) of the overall respondents saw that all of the provided options were present in the presented lessons. A small minority of 9.5% (2 respondents) was scored

for each of ‘authentic materials for real-world language exposure’ and ‘practical language tasks mirroring oil drilling language demands’. Only one respondent (4.8%) opted for ‘collaboration with industry experts for language and communication workshops’. However, none of the respondents selected ‘online resources and applications for oil drilling-related content’ or ‘regular assessment and feedback for continuous improvement. Likewise, ‘Other’ option was not chosen, revealing no other notable aspects beyond the discussed key characteristics of FCM implementation in ESP classes.

Figure 417

Key Aspects in the Presented Virtual and In-Person Oil Drilling Lessons

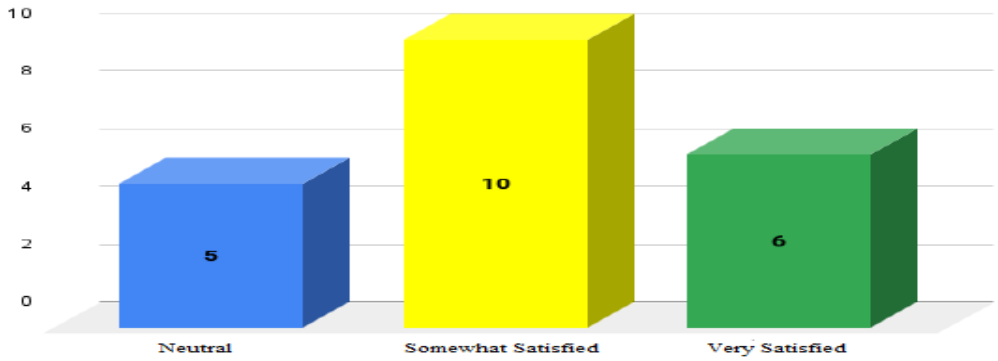


23) Are you satisfied with the content and topics covered in the English sessions?- Very satisfied / Somewhat satisfied / Neutral/Undecided / Somewhat dissatisfied / Very dissatisfied

The data distribution exhibited a high inclination towards the respondents’ satisfaction regarding the content and topics covered in the English sessions. The bar chart showed that 10 respondents, making up a percentage of 47.62%, expressed a moderate level of satisfaction on this particular issue. High level of satisfaction made up 28.6% (6 respondents) of the overall feedback received on this matter. 23.8% (5 out of 21) of the respondents maintained a neutral stance. However, none of the questioned students (0%) expressed dissatisfaction with the implemented English for oil drilling lessons.

Figure 428

Level of Satisfaction with the Content of ESP Sessions



24) How ready and willing are you to transition from traditional teaching methods to digital approaches?

Table 29

Readiness Level for Adoption of Modern Learning Approaches

	Frequency	Percent
I am uncertain of their efficacy	1	4,8
Neutral/Undecided about transitioning to digital approaches.	1	4,8
Mostly prepared and willing to explore digital approaches	11	52,4
Fully prepared and eager to transition.	8	38,1
Total	21	100,0

Inclination towards total transition or having more opportunities to try the digital approaches gained the highest number of responses. For greater access to the digital techniques, the findings revealed a percentage 52.4% (11 out of 21) of the overall respondents. A proportion of 38.1% (8 out of 21) expressed a total readiness for a complete shift towards the adoption of digital methods. A single respondent expressed uncertainty about the efficacy of these modern teaching approaches while another maintained a neutral stance about the issue.

25) **How would you rate your overall experience with FC approach in your English course?- Very satisfied/ Satisfied/ Neutral/ Dissatisfied/ Very dissatisfied**

The distribution of the data showed a leaning towards satisfaction among the respondents considering their experience with FCM. The lion's share of respondents, accounting for a portion of 47.62% (10 out of 21), indicated they were satisfied with their involvement in FCM. 23.8% (5 out of 21) of the total participants expressed an alignment with the predominant orientation, but expressed an even higher level of satisfaction, categorized as 'Very Satisfied'. 28.6% (6 out of 21) of the entire pool of respondents adopted a neutral position regarding this issue. However, absolutely no respondents (0%) described their experience with FC course as negative.

26) **Which teaching approach do you prefer? -Traditional classroom instruction/ Remote learning approach / Blending both/ No preference**

Table 30

Educational Approaches Preferences

	Frequency	Percent
Traditional classroom instruction	2	9,5
Blending both	13	61,9
Distance learning approach.	6	28,6
Total	21	100,0

As it pertains to the teaching approaches preferences, a vast majority comprised 13 respondents with a percentage of 61.88% opted for blending both face-to-face and online methods. 6 respondents making up 28.6% of the total respondents considered distance learning as the most preferable approach. A marginal minority of 2 respondents (9.5%) believed in the efficacy of traditional teaching methodologies.

27) Do you recommend the use of the FC approach in teaching English in the oil drilling specialty in the future? Yes, I strongly recommend it / Yes, I recommend it / Neutral/ No, I do not recommend it / No, I strongly do not recommend it.

As far as the use of the Flipped Classroom (FC) approach in teaching English for the oil drilling discipline was concerned, the predominant portion of respondents strongly recommended its future incorporation. This portion consisted of 61.88% (13 out of 21) of the overall respondents for strongly recommended it and 28.6% (6 out of 21) for recommended it. A negligible minority of a single respondent (4.8%) strongly opposed the integration of the Flipped Classroom Model (FCM) in the future. Another 4.8% of the participants maintained a neutral position.

Table 31

Recommending The Future Integration of FCM

	Frequency	Percent
No, I strongly do not recommend using it	1	4,8
Neutral	1	4,8
Yes, I recommend using it	6	28,6
Yes, I strongly recommend using it	13	61,9
Total	21	100,0

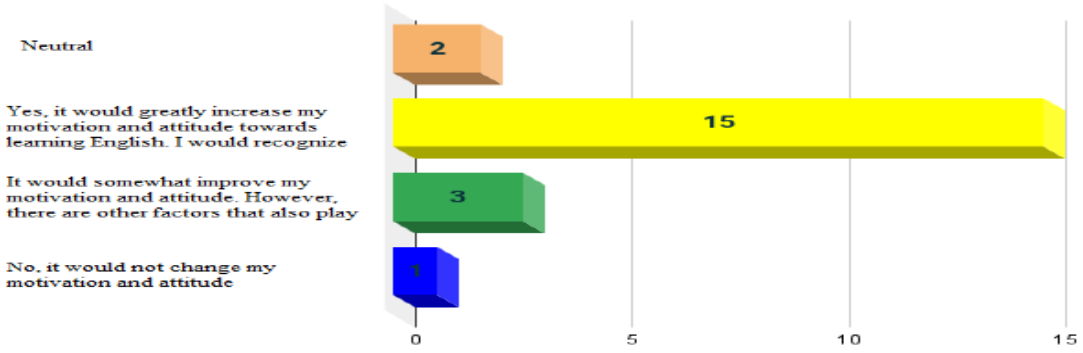
28) Would increasing the coefficient of English enhance your attitude and level of motivation towards learning English?

Focusing on the relation between learners' motivation towards learning ESP and the coefficient of this subject, an overwhelming majority of 71.43% (15 out of 21) of the total respondents believed that increasing the coefficient of English as a module would greatly raise their motivation and enhance their attitude towards learning it. Put it differently, a higher

coefficient value indicated a greater importance of the subject matter, leading to prioritized efforts accordingly. The other options of the MCQ gained marginal percentages. A small minority of the responses amounting for 14.3% (3out of 21) suggested that this would lead to modest enhancement of their motivation, believing in the existence of other factors that also affected their attitude towards learning English. A marginal minority of 2 respondents (9.5%) maintained a neutral stance as they could not decide about its impact. Only a single respondent affirmed that the value of the coefficient had no influence on their attitude towards ESP.

Figure 59

Impact of ESP Coefficient Value on Participants' Motivation and Attitude



29) Regarding your experience with learning English, what strategies or approaches do you believe can be employed to enhance interest and engagement during an English session?

For this qualitative question, the learners were supposed to propose the best methods or strategies they convinced in their potential for enhancing learners' interest and engagement during English classes in the oil drilling specialty. 16 out of 21 participants suggested valuable recommendations for maximising interest and engagement in ESP classes. Additionally, one respondent stated a neutral position. That is, 15 responses would be analysed to indicate any significant topics with the aim of meeting learners' needs.

In the coming lines, the qualitative findings would be listed. Two participants believed in the efficacy of traditional teaching methods to improve the interest in ESP. Five others opted for employing English as a medium of instruction to teach the content of all subject matters in oil drilling department. One of those participants stated that “there should be attempt to incorporate English language across all courses and consolidate its implementation through online lectures”. Another participant contended the significance of “increasing the coefficient and the time allocated for teaching English both in-person and online”. “Make it more interesting by relating it to the engineering subject” was the suggestion of another student. Another one proposed to “schedule the appropriate time for English sessions”. Variety in the content of English curriculum was the point of another respondent. The remaining four students emphasized the need for more hands-on, interactive learning, such as “online and face-to-face communication and conversation”, “interaction with teachers from all over the world and engaging in communication with them”.

5.3.2. Findings of ESP Teacher Post-Study Interview

The last phase in conducting this research related to the implementation of a designed flipped course was administering an interview with the volunteering substitute ESP teacher (Teacher A). Unfortunately, the official ESP teacher was occupied with other academic commitments during the implementation of the teaching approach under study (Teacher B).

The analysis of the post-study interview collected data was based on categorizing the designed questions into major themes right from the departure of the study. The upcoming categories were covered in this interview: Readiness for alternative teaching approaches; language problems and instructional language; student improvement and impact of English; Flipped Classroom Model; challenges in managing student interactions, behaviour and attention; lack of presence and participation in sessions; attitude and care towards English; and lastly, program support in teaching.

With regard to the types of the asked questions, a number of them provided options for the interviewed teacher with the aim of remaining focused on the topic, a better understanding of the questions and a more efficient exploration of key areas of interest. Additionally, while transcribing the responses, the researcher refined the expressions and concepts used by the ESP teacher to comply with the didactic context and ensure the use of precise terminology.

Section 1: Readiness for Adopting Modern Teaching Approaches

Question 1: Are you open to adopting alternative teaching methods, such as the flipped classroom method?

The ESP teacher had a positive attitude towards adopting modern digital approaches. However, she stated that experts' support and guidance was needed for an effective transition. In addition, she emphasized the necessity of having a minimum digital literacy.

Question 2: Was the designed English course effective for creating engaging pre-recorded materials, designing meaningful in-class activities, and managing student interactions in a flipped classroom?

The ESP teacher stated that the designed English course effectively created engaging materials and practical in-class activities, and organized class interactions. The introduced arguments were: Materials maintained attention of the majority of students, activities involved to some extent their skills of critical thinking, problem solving and collaboration in some tasks; active students were able to communicate their answers and ideas.

Section 2: Language Problems and Instructional Language

Question 3: What language problems do your students encounter when applying the flipped classroom model?

With regard to the language problems appearing from the implementation of the course, the target students faced no difficulty in understanding the vocabulary related to their field of study. They did not focus on the grammar errors when speaking. Rather, their main

challenges resulted from a lack of courage to engage in activities and the negative influence of peers. They were hesitating despite having the necessary foundational knowledge in their academic discipline. That is, they lack confidence required for efficient participation.

Question 4: What challenges did you face when implementing the flipped classroom model?

The ESP teacher believed that the major challenge hindering the application of the flipped course was student engagement and motivation. This lack of engagement led to becoming unsure about the effectiveness of the presented content. Another challenge stemmed from the noise caused by some students during ESP sessions. She also considered absence of teacher training as one of the major challenges for teaching in general, let alone the implementation of modern teaching approaches. For her, every novice teacher should have some basics for practicing teaching.

The suggested issues related to the course itself (the quality of digital or in-class materials, in-class activities suitable for learners' needs and styles), classroom management (time, interactions) and personal and technical problems (workload, possessing tech devices, access to internet) were beyond this teacher's knowledge.

Section 3: Student Improvement and Impact of English

Question 5: Do you think that students improve by the end of implemented English course?

The interviewed teacher declared that there was noticeable improvement in in-class learners' motivation, though it was limited. More students maintained their attention with class practices. For online sessions, their engagement was low if it was to be measured with the students' answers to online tasks of this phase.

Section 4: Flipped Classroom Model (FCM)

Question 6: Is the flipped classroom model easy to implement?

The teacher response was “yes, it is easy to implement if you have enough teaching experience. But, it is difficult for a novice teacher to teach without the help of experienced teachers”.

Question 7: If you find this type of teaching difficult, please justify why?

The ESP teacher believed that the difficulty in implementing FCM came first from the lack of training in it. She also emphasized the requirement of having technical skills as it depends heavily on modern technologies. With regard to the difficulty in finding or creating suitable digital materials (e.g. videos) for students, she said that she did not engage in that experience before. She was right as it was the mission of the researchers to design the course to be put into practice and test its effectiveness. Concerning the challenges in facilitating post-class instructional support and students’ resistance to online sessions, the study should be conducted in a longer time to practise these tasks and assess their complexity.

As for the other proposed options, the teacher declared that it was more suitable for learners to answer and decide about their influence. Those options covered: Limited access to technology or resources for viewing and evaluating pre-class materials; insufficient time for adequately viewing and evaluating pre-class activities; limited student access to necessary technology or internet connectivity outside of the classroom.

Question 8: Do you recommend the use of the flipped classroom in teaching English in the future?

As far as the incorporation of FCM in teaching oil drilling course is concerned, the ESP teacher recommended its use, but under some conditions. She insisted on the importance of training teachers and suggested devoting much time for the sessions of ESP to ensure better learning quality.

Section 5: Strategies to Maintain Student Interest and Managing Their Behaviour

Question 9: What is the common challenge in managing student interactions?

The participating teacher confirmed that fostering students' engagement seemed to be the hardest task. She added that she made a great effort to encourage them to participate during the face-to-face session. Yet, she mentioned that some students' attention and desire to take part in the tasks was observed.

Question 10: What are the recommended strategies to create a positive learning atmosphere for the target adult learners in ESP classes?

Drawing from her modest teaching experience, the ESP teacher advised any teacher to communicate clear guidelines for student behaviour. She also encouraged involving learners in discussions in English, regardless of any negative comments.

Section 6: Presence and Participation in Face-to-Face Sessions

Question 11: What were the reasons for students' regular absenteeism from face-to-face English sessions?

The participating teacher believed that the lack of motivation and interest in the sessions of English as a secondary subject was the major reason for students' regular absenteeism. Additionally, some students encountered clashing time commitments with the ESP classes scheduling such as being engaged in part-time employment.

Question 12: Why was there a lack of participation in online sessions?

The interviewed teacher contended that university students living on campus suffered from internet availability. So, the majority of them could not have access to digital content and perform the accompanying tasks.

Section 7: Increasing Learners' Interest in ESP Sessions

Question 13: Would increasing the coefficient of English enhance students' interest and engagement with ESP?

The ESP teacher totally agreed that increasing the coefficient of English would significantly stimulate students' interest and engagement with the session of ESP. This procedure would also meet the new status of English as the medium of instruction.

Section 8: Designed Course's Support to ESP Teaching

Question 14: Did the designed English course using flipped classroom enhance your teaching practice? Why?

The responding instructor contended that the designed flipped lessons she presented significantly enhanced her teaching practice. According to her, it provided useful instructional materials and steps to follow when teaching.

Question 15: In your experience with learning English, what strategies or approaches do you believe can be employed to foster learners' proficiency in English?

The interviewed teacher was convinced that involving students' in communicative situations is the best strategy to encourage them to speak in English. By doing so, they would find themselves obliged to use it. She added that the most appropriate activity in this case would be collective projects and oral presentations in their field of study. This would help them develop their collaboration, communication and presentation skills needed for future academic events, notably the defence of their Master's dissertations.

Conclusion

To wrap up, chapter five presented the analysis of the data collected during the implementation of the FCM. Graphic visuals, notably pie charts and bar graphs summarized the findings. The pre-study questionnaire showcased findings about the learners' needs and expectations from ESP classes and their attitudes and experiences with digital teaching approaches. ESP teachers' interview introduced details about the situation of ESP in the Department of Mechanics and Drilling of Oil Fields coupled with their perceptions and

expectations from the integration of modern digital technologies and instructional methods in this department.

The analysis of the data obtained from classroom observation, conducted during the implementation of the study intervention, revealed information about the existence of the key aspects of FCM. The novel element was the inclusion of the pre and post online phases under investigation as part of observation. It entailed exploring the interactional behaviours of both teacher and students, the components and phases of the lessons, the fundamental learning skills employed by the oil drilling students, the level of motivation towards and engagement in activities achievement.

The findings of the post study data analysis addressed learners' as well as ESP teachers' evaluation of the sample lessons of the suggested course for oil drilling as well as their feedback about FCM. The results of the students' questionnaire were organized into particular themes related to the topic. They revealed an inclination towards the FC as an instructional strategy and provided a positive feedback towards the presented lessons. However, they highlighted some obstacles hindering its application such as the limited access and availability of the internet. In addition, the findings suggested a set of recommendations and implications such as the required strategies or approaches necessary for the increasing learners' interest in English classes in the target department and ensuring learning efficacy. These included devoting more sessions for ESP teaching and involving learners in collective project-based activities and oral presentations.

In the next chapter, the findings were discussed and interpreted to find out their meaning in relation to the topic of the current research. The primary research questions were answered to refute or prove the settled hypotheses related to the effectiveness of FCM in designing and teaching ESP.

Chapter Six

Chapter 6: Discussion of the Findings, Implications and Recommendations

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Introduction

The current study investigated the possibility of integrating FCM in designing and teaching the ESP course at the Department of Mechanics and Drilling of Oil Fields. To that end, many research tools were administered to collect the necessary data. An analysis of those data was conducted to find out the main themes emerging from the students' and ESP teachers' contributions through their valuable responses to the questions covered by the questionnaires and interviews along with the remarked findings of the face-to-face proceedings and interactions classroom observation.

Firstly, the findings of this research were examined. Secondly, they revealed major themes through the data of each of the research tools. Then, they were discussed in relation to the initially asked research questions concerning the level of effectiveness of FCM in designing and teaching English for oil drilling course at Kasdi Merbah University, the required factors to ensure the efficiency of this teaching approach in fostering oil drilling students' communicative skill in academic and professional settings, the attitudes of those student and their ESP teacher towards the new applied teaching approach, and its potential of creating a supportive atmosphere for promoting adult learning principles and 21st century skills.

6.1. Pre-Intervention Key Insights

6.1.1. Needs Analysis

The findings were discussed following the themes included in the NA questionnaire to be better organized and avoid skipping any ideas or any new appearing trends. The researchers obtained detailed information about the various learners' personal profiles and educational requirements.

Demographic Influences on Learners' Needs and FCM Adoption

The age and gender categories tried to showcase the types of learners in the Department of Mechanics and Drilling of Oil Fields and the effect of their motivation and learning goals on the designing and teaching ESP courses in the digital age. The learners' personal profiles provided details about their educational requirements. The research division of the age categories came to describe: First, young students, forming the majority of the sample respondents, were probably university students, not yet engaged in permanent professions (20-25 years old); the second category consists of learners who experienced some sort of professional career and personal commitments (25-35 years old); lastly, mature learners expected of having more differentiated life experiences (more than 35 years old).

These divisions aim at assisting to design a course fitting and meeting all target age groups represented by the selected sample taking advantage of their learning experiences and preferences. As noted by Wang et al. (2009), age influences the adoption of digital learning, with younger individuals generally showing stronger intentions to use technology-based learning. According to these researchers, the reasons are due to two factors: The belief that technologies adoption enhances the effectiveness of learning; social influence of important others (e.g. family, teaching staff, etc) of the valuing technology integration in education.

This section of needs analysis questionnaire entails that the designed course was tailored to better engage and address both genders and different age groups. The prevalence of younger learners (20-25 years old) on the respondents' participation could mean that they exhibited more openness to digital learning approaches due to the primarily posed hypothesis that the FCM would be successful due to the nature of the learners as digital natives. By forming the majority of the sample by this age category (20-25 years old), showed that the youngest learners were attending the ESP sessions because they had no other personal

commitments or permanent professional engagements. Knowing that selection basis of the purposeful sampling in this study was the presence of learners.

Moreover, the older learners were less presented in the sample, probably because of their non-academic commitments. Thus, the integration of FCM would be in favour of these older learners as it blended both face-to-face and online instructional strategies. This aligns with Vavilina's (2020) claim suggesting that ESP teachers have to take advantage from technological progress and consider the changing higher education context.

NA questionnaire collected details about participants' gender to ensure encompassing the two genders' learning needs in the suggested ESP course meeting their technological capabilities and tendencies. As noted earlier, the female students were a tiny minority in this Master's cohort of oil drilling specialty at Kasdi Merbah University due to the previously mentioned socio-cultural and practical reasons. The data reinforces the notion that females' effective learning is shaped by social interactions and autonomous learning (Wang et al., 2009). This explains the low percentage of female students in the target departments. In addition, this concept highlights the fact that FCM suits female students by autonomously viewing the online instructional content and then, engaging in discussions in groups entailing that content. This also aligns with the findings of the study conducted by Chiquito et al., (2020). The latter affirm that implementing FCM in an engineering course has positive impact on student performance, especially for females.

Participants' Perceptions of Their English Proficiency

The three levels of English proficiency (beginner, intermediate and advanced) were represented in the selected sample of learners. The prevalence of the advanced level was due to the inherent necessity of using English in oil drilling specialty. Putting it differently, the regular studies of these learners required a basic understanding of English, notably the technical terminology which the learners commonly utilize in their regular studies. This

indicates English is a requirement for learners' better engagement with their studies. In this vein, previous studies, such as that by Parkinson (2012) indicating that English is vital in science and technology as it supports learners' access to their field specialized content as well as effective interdisciplinary communication. Another study echoing the conclusions of our research is that of Rao (2014) stating that English serves as a lingua franca in the disciplines of science and technology, guaranteeing successful communication and collaboration.

With regard to these findings, learners with beginner and intermediate levels needed additional support with a minimum of English level to effectively engage with courses across all modules in the Faculty of Hydrocarbons in Kasdi Merbah University after adopting English as a Medium of Instruction in the Algerian Higher Education. This new situation puts an extra emphasis on learners to possess the language necessary skills to expand their knowledge and meet the requirements of their field of study, and hence, ensure better educational performance and a high-quality free training to advance their future career opportunities. Insights of the study of Rao (2014) highlight engineering students' need strong English proficiency skills to meet the requirements of the oil industry demands and enhance their employability opportunities. Thus, enhancing educational resources for teaching English for Oil Drilling would help bridge the gap between the students' existing language skills and the language demands of their academic requirements.

These findings are affirmed by matching them with those of the initial description and exploration of the research setting in the methodology section. A tough necessity arises to shed the light on designing or reforming specialized curricula in the target department. This step was significant in enhancing the ESP teaching there, pushing students to actively take part in and efficiently complete their studies to get prepared for better performance in the future workplace. In this vein, it has been the fundamental objective of this study to overcome these ESP teaching challenges through designing the current course.

Learners' Experiences and Attitudes towards Learning English

Consistent with the findings of Shamrao (n.d.), oil drilling students show a preference for activities involving communication using English to interact with people all over the world via written channels (chatting). Supporting the conclusions of Rao (2014), the findings also highlight a tendency towards cooperating and sharing ideas and experiences with their counterparts on the international arena. The document underscores that using English for communication in engineering is vital for effective collaboration across diverse teams and international contexts. Proficiency in English enables engineers to share technical knowledge, understand complex concepts, and engage in global discussions; ultimately enhancing innovation and project success. These two needs comply with the core essence of the objectives of ESP and modern teaching approaches based on digitalizing classes.

Regarding the reasons for learning English, the participants emphasize the significance of English as an international language of academia and communication, indicating their awareness of English as one of the requirements of the globalized age. In addition, the previous findings were affirmed by the recognition of English proficiency as important by all respondents indicated a shared understanding among them of its significance in their field of study. These findings reinforce the work of Nabiilah (2021), investigating the reasons behind the significance of English language for engineering students.

With respect to their preferred learning strategies, the study participants enjoyed being engaged in real communication with international individuals and using audio-visual instructional materials. The findings in this case stand in equivalence with those of Abante et al. (2014) and Tulsi et al. (2016), putting emphasis on active engagement through hands-on activities, discussions and group work, utilizing visual aids to improve understanding and retention. Therefore, an implication for integrating technologies in the English classes is an opportunity to overcome the challenges of the traditional teaching methods. This finding,

along with others, reinforces the need for designing the target course around FCM which is inherently based on technology incorporation, active learning and collaboration among students.

Option ‘other’ opens the door for the respondents to signal any of the personalized techniques or resources they regularly relied on to learn English such as podcasts or audiobooks and mobile apps or digital tools. Al-Tamimi and Shuib (2009) point out to such resources and find that the participant students engage with English-language films to improve their proficiency. This also demonstrates the development of the tendency of autonomous personalized learning through depending on new materials other than the conventional classes of English resources and documents. That is, they are open to the adoption of new innovative ways and tools for learning English. This study result is a prompt for designing and implementing the oil drilling course using the contemporary technology-dependent educational approach FCM.

In this pre-study questionnaire aiming to evaluate the attitudes of the oil drilling students, a remarkable percentage of them showed a positive stance for English learning. Additionally, these positive attitudes towards learning English are mainly due to their previously highlighted awareness of its importance as well as their favourable English language learning journey before engaging in the postgraduate studies. This evidence echoes the findings revealed by the study of Al-Tamimi and Shuib (2009) conducted with petroleum engineering students at Hadhramout University of Sciences and Technology.

As highlighted by Al-Tamimi and Shuib (2009), the findings also suggest that these individuals’ positive learning experiences profoundly affect their expectations and preferences. They practise and are exposed to the target language in a constant way that offered them gradual progress. Immersive learning situations personalize teaching (watching movies and playing video games where English was used) and in some cases intrinsic desire

for language acquisition are empowering aspects. Others want to learn it for its prestigious status as global language. The teachers are recognized to have empowering push to refine the educational journey. To that end, the designed course has to provide enough opportunities for the target learners to communicate efficiently in English.

Moreover, the designed course would be an attempt to minimize the effects of past negative learning experiences with the aim of encouraging those having bad experience to confidently move forward and take risks in the way of their academic success, especially with promoting English to be used as a medium of instruction in the Algerian universities. This aligns with the findings of Al-Tamimi and Shuib (2009), highlighting that the creation of a supportive learning environment that fosters positive support and meets students' objectives improves their motivation and engagement for English learning. That is, a pressing need emerges to make the necessary reforms on the courses and teaching approaches used in the oil drilling field to teach English.

All in all, the insights gained from evaluating students' stance regarding English learning indicate that the majority emphasizes its significance. In addition, many express a certain level of satisfaction with respect to their learning journey. Therefore, the researchers got more confidence and readiness to design the intended course.

Learners' Difficulties Related to English Four Language Skills

When describing the challenges facing the target learners with English language regarding the four skills, the findings revealed a consistency with the previous findings. They seemed to have an accepted level of proficiency. For instance, the type of difficulties related to the listening skill indicated that they transcended the basic language elements of grammar and vocabulary and moved to focus on more advanced aspects of English listening comprehension. In the same context, their lack of comprehending accents suggested they were acquainted with the Standard English pronunciation and were aware of the existing variations.

Regarding their problems with speaking skill, the majority of the respondents lacked adequate vocabulary and accurate grammatical rules. This meant that they had already possessed a basic language enabling them for communication.

As for reading skill, additional evidence supporting the previous argument that the learners showed an accepted level of proficiency was deduced from the type of problems matched to the skill of reading. Once again, the lack of vocabulary was the main challenge for the learners. A minority of oil drilling students reported their need to translate into Arabic in order to comprehend the texts of their discipline as of an insignificant importance. This view suggested that the majority possessed sufficient English proficiency level allowing efficient understanding of passages immediately without resorting to Arabic translation.

Consistency in the learners' answers was noticed in addressing their problems with writing as a productive skill. Once more, they emphasized the lack of the necessary vocabulary allowing them to express their ideas and participate effectively in ESP classes. Moreover, the predominant majority persistently affirmed they did not depend on native language when getting involved in contexts where English was a requirement.

Key Factors Leading to Enhancing Learners' English Proficiency

Interestingly, the findings of the needs analysis questionnaire highlighted the dominant learners' awareness of their centeredness as key driver for improving English language proficiency level, instead of reliance on ESP teachers' efforts. They emphasized the significance of having access to suitable educational materials meeting learner's needs and proficiency level. Yet, no significance has been given to the role of the teacher.

As far as the challenges related to the four language skills were concerned, the major problem was the restricted terminology of their academic discipline. This hindered effective communication with others and engagement in class activities. In their view, the key factor to address this limitation was the employment of English in academic contexts. In this context,

Ahmadi (2018) sheds the light on the significance of utilizing technologies to improve these language skills as they provide interactive resources, encourage collaborative learning among peers, enhance learners motivation, and support autonomous learning. That is, the integration of FCM, which is in-essence a tech-based teaching model, is expected to have a positive impact on teaching English skills.

Learners' Description of Good Course Criteria

Based on the insights obtained from the analysis of the collected data from NA questionnaire, the designed course focuses on:

-Creating opportunities for learners to participate and communicate their ideas: So, the suggested course would be constructed depending on the inclusion of communicative activities as well as provision of opportunities for collaborative learning. This aligns with the previous research by Shamrao (n.d.),which emphasized the importance of English communication in engineering classes. It also aligns with the Bergmann and Sams (2012), stating that “our students realize they are better when they work as a team rather than when they work alone” (p. 84) when adopting FCM. Bergmann and Sams (2012) argue that encouraging collaborative learning stands at the core of 21st-century learning and “will soon enter the world of work, and people rarely work in isolation. The students will become part of teams solving problems” (p. 84). Thus, they develop their FC model to meet these requirements.

-Balancing between independent and guided learning strategies: That is, the designed course needs to emphasize learner-centeredness and recognize a moderate stance for the ESP teacher. By designing a course where FCM is implemented, this requirement is met as supported by Bergmann and Sams (2012). The latter argue that within the FC framework learners are responsible for their learning by independently engaging with the learning content in the pre-class phase while the teacher plays the role of expert feedback provider and controller of the

learning process. Additionally, the concept of keeping a balance between independent learning and guided one is supported by Ahmadi (2018) who believes that it can be fostered by the effective integration of modern technologies. Insightful strategies are presented by English and Kitsantas (2013) to support this type of learning atmosphere. These researchers require instructors to provide structured support during initial learning phases, and then gradually reduce guidance as students foster the intended self-regulated learning skills. This gradual development can be facilitated through techniques such as scaffolding, formative feedback, and ongoing reflection on the learning process.

-Encouraging active learning: Learners need to be encouraged to take their responsibility for their studies. This finding is consistent with English and Kitsantas (2013) who state that this type of learning can be enhanced through involving learners in problem-solving and project-based tasks. Another alignment to the our research findings is found in the work of Bergmann and Sams (2012) which presents innovative strategies to prompt active learning by following the guidelines of FCM. That is, FCM stimulates active learning through transforming conventional lectures to homework by assigning students to engage with content at their own pace outside class time. In class, learners are involved in achieving hands-on activities, communicating any individual misconceptions, as well as taking the responsibility of peer deeper understanding of the target content.

-Using digital instructional materials, notably videos, in the ESP course reflecting the requirements of the era and nature of digital-native students: The participants consider the use of digital technologies as one of the essential criteria of a good course. In line with this finding, Motteram (2013) considers the incorporation of digital technologies as a key aspect for evaluating the quality English language course, arguing that their effective use serves modern education objectives, including enhancing learning experiences, supporting collaboration, and offering opportunities for personalized learning.

-Acknowledging the role of interaction with ESP teacher in fostering communicative skills: With regard to our study, this criterion is also highlighted by Motteram (2013), who states that effective engagement with teachers facilitates tailored learning experiences and helping students apply language skills in authentic contexts. Likewise, the belief that interaction with ESP teachers enhances communication skills learners is advocated by the developers of FCM, affirming that "we [teachers] are answering questions, working with small groups, and guiding the learning of each student individually" (Bergmann & Sams, 2012, p. 27).

-Oral presentations were highly recommended to be opted for as learning activity involving learners' to communicate in English: In alignment with our research findings, this learning activity is found to be vital in enhancing English communication skills among learners by English and Kitsantas (2013), by providing opportunities for students in project-based learning to present their research results, engage in discussions, and seek feedback. Barrett and Liu (2016) also highlight the importance of oral presentations as they bridge the gap between non-native learners' language learning and practical articulation in diverse contexts. Additionally, they outline a set of these activity advantages, such as fostering learner autonomy and confidence, emphasizing purposeful communication over accuracy, and training students for global academic and professional contexts. Further, oral presentations foster collaborative learning by stimulating peer interaction, seeking feedback, and sharing their ideas and perceptions (English & Kitsantas, 2013; Barrett & Liu, 2016).

-Hands-on interactive activities aim to promote active learning, develop critical thinking and problem-solving, and enhance retention of the learned content: This result is consistent with the confirmed benefits of the hands-on activities use in engineering classes highlighted by Musikhin (2016). The latter outlines a set of advantages of this type of activities in teaching English for engineering students, including improving engagement and motivation, putting into practice the addressed theoretical concepts, elevating critical thinking and communication

skills, promoting collaborative learning, providing opportunities for immediate feedback, and improving cultural competence needed to adapt to diverse engineering contexts.

A further point to be considered, the questionnaire items related to the importance of stating the course's primary objectives for learners and providing opportunities for peer feedback provision receive little attention by the respondents. Contrary to our findings, Ermakova and Rossikhina (2021) prove that defining the goals of the course for learners enables their understanding of the relevance of language skills in their field of study, so that they can focus their attention and efforts on the appropriate aspects of the course. Despite the view of our study's respondents, the learning objectives are included in the designed course as part of the current research with the aim of assessing the efficacy of FCM in teaching English for oil drilling classes. As for the impact of peer feedback on enhancing learning, Nilson (2003) emphasizes its significance. According to this researcher, peer feedback serves at promoting students' learning as it involves critical thinking, communication, and collaborative skills while assessing other's achievements or contributions.

To sum up, the needs analysis questionnaire perfectly aligns with the characteristics frequently attributed to criteria of modern teaching approaches and reflected the needs of the new generation of learners throughout this section of the questionnaire. Its findings emphasize the significance of balancing active learning and teacher's guidance. They also affirm the effectiveness of communicative and collaborative learning activities as well as integrating digital teaching materials in improving English proficiency. In addition, they showcase making a creative atmosphere through hands-on interactive activities.

Learners' Preferences Related to the Types of Classroom Activities

In this section, the NA questionnaire aims to identify key learning skills that should be incorporated into modern ESP classes following the guidelines of FCM. To that end, students examined those skills corresponding learning activities types and decided about their

importance for their academic discipline and needs. With regard to the obtained findings, all of the suggested learning activities receive a level of importance by the respondents ranging between ‘Extremely important’ and ‘Moderately important’. Such importance is consistent with the previous studies which emphasize different learning activities in teaching English for engineering disciplines. Instances of these studies put emphasis on interactive aspect and include the following: The study of Nilson (2003) provides the instance of the structured peer feedback; the research of Musikhin (2016) considers the role of interactive classroom tasks (e.g. role-plays and group work) in promoting communication skills; the investigation carried out by Lau and Gardner (2019) prioritising the use of interactive activities mainly discussions and group work to improve learners’ communication skills and autonomous learning.

As far as the learning activities to be included in the suggested flipped oil drilling course are concerned, the above techniques are found in alignment with the underlying skills upon which FCM is based. These research findings would help at selecting or adapting learning tasks from the previously described textbooks, and then, complying them with the requirements of the stages of FCM. Moreover, the learners were familiar to the previously mentioned strategies in their academic discipline as part of engineering principles scheduled in the time table (Appendix B) such as Analyse ‘Numérique and Petro physique’ as well as skills related to language such as ‘Anglais Téchnique’ (Technical English) and ‘Communication écrite et orale’ (Written and Oral Communication). The upcoming are instances of the techniques to be integrated:

- Summarizing, synthesizing and reporting techniques to foster active learning and comprehension, critical thinking, and efficient communication.
- Authentic English conversations would develop learners’ use of critical thinking skill to identify any specific communication strategies in new situations.

- Academic discussions about issues related to oil drilling field of study during in-class as well as virtual phases of FCM.
- Taking notes mainly during the interaction with experts and academicians in the field of oil drilling and hydrocarbons.
- Argumentative reasoning to defend their positions and points of view while communicating in English.
- Comparative analysis allowing critical analysis of particular information related to issues in the core of the current academic field of study and ultimately communicating the underlying similarities and differences.

Learners' Experiences with Online Education

Regarding the respondents' diverse experiences, the findings provided details about challenges they encountered with digital learning. They would be carefully considered to ensure an effective implementation of the Flipped Classroom model. Interestingly, they indicate that the availability and access to Internet connectivity is the main problem hindering the efficiency of online learning. These findings are in consistency with those of Larbi and Zitouni (2021) as well as Rahmani and Zitouni (2022) with regard to internet issues in the Algerian context.

In conjunction to this result, it is important to incorporate strategies to address those challenges and efficiently implement the flipped oil drilling course regardless. With regard to internet access, the current study's main focus already found a strategy to overcome the barriers that hinder the effectiveness of virtual education. In this vein, the adopted technique entailed sending digital materials to students a long time prior to physical ESP sessions, overcoming the unavailability of internet in the university campus. Other techniques are suggested by Bergmann and Sams (2012) out of receiving complaints from the teachers who implemented FC teaching model. Learners can access content offline by uploading it on

devices such as USB drives or DVDs. Additionally, teachers can ensure this access by providing printed handouts summarizing the key concepts of the digital content. Yet, in our case, these two techniques cannot be adopted given the short and limited time frame of the study.

6.1.2. ESP Teacher's Interview: Pre-Intervention Insights

Because two ESP teachers were involved in this study, the findings sought to identify any similarities and differences between their attitudes, practices and expectations about ESP teaching in the Department of Mechanics and Drilling of Oil Fields. This research also intended to uncover any recommendations on their behalf to enhance the quality of learning.

Teachers' Profiles

Through collecting demographic data of the interviewed ESP teachers, the researchers seek to find out any details matched to the status of ESP teaching in the target department. These would assist at constructing an overall overview about the teachers' role in the teaching process there before initiating the design and implementation of the ESP course. Through comparing ESP teachers' profiles, there are several emerging differences. They reveal a pressing necessity for training ESP teachers and providing more importance for teaching English, notably because of its new status as a medium of instruction in the Algerian universities. This finding is in consistency with the work of Larbi and Zitouni (2021), which puts focus on providing adequate training for instructors.

More significantly, the technical branches heavily rely on English language as affirmed by Bergmann and Sams (2012). Further, the findings highlight the heavy responsibility placed on appointed ESP teachers to design and teach courses without having any prior experience, specializing in ESP teaching and even absence of needs analysis. This situation aligns with that described by Boudersa (2018). Contrary to our findings in the Department of Mechanics and Drilling of Oil Fields where English has significantly replaced

French, Assassi (2021) claims that French has been prioritized over English. That is, there is a notable enhancement and alignment to the demands of the current globalized world by adopting English as a medium of instruction in the target educational institution.

Teaching Approaches and Content

Contrasting attitudes towards teaching approaches are identified due to different teaching experiences in the Faculty of Hydrocarbons. In order to avoid students' skipping the sessions of English, the more experienced teacher (Teacher A) appreciates the institutions' policies of adopting online teaching modality for the instruction of ESP. This perspective is entirely consistent with the underlying foundational principle of the flipped classroom approach and it has been the primary cause for its emergence as affirmed by its developers Bergmann and Sams (2012). The latter have started the implementation of this approach to meet the needs of students missing classes or lectures details for different reasons, allowing them to access the instructional content at their own pace and learn beyond the walls of schools.

Returning to our research findings, both teachers are aware of the learners' top priority of having English instructional program which is discipline-specific, instead of General English. This stands in consistency with the perspective of Parkinson (2012), which considers integrating authentic genres as one of the main features of ESP courses for science and technology branches.

However, not all aspects of ESP teaching are there in the lessons of ESP teachers. Putting it differently, needs analysis has not been conducted by both teachers before initiating English lectures or designing a course. These results are not consistent with the insights drawn from previous studies emphasizing the significance of needs analysis for designing ESP courses in general such as Hutchinson and Waters (1987), and for in science and technology students in particular by Parkinson (2012).

Further consideration of the findings reveals that there is lack of coordination between Teacher A and content experts in the department. Conversely, this is not the case for Teacher B who is a content expert himself and is a teacher of another fundamental subject matter in the Hydrocarbons Faculty. In this context, insights are drawn from several researchers who consider collaboration between language teacher and content expert vital aspect for designing ESP courses and ensuring relevant materials selection, such as Hutchinson and Waters (1987), Parkinson (2012), and Saliu (2013).

Another point to address is falling back on code switching using languages (Arabic or French) other than English to explain particular concepts. This entails the necessity of training the teachers of English training to raise their awareness of code-switching and guiding them to consciously monitor their language use in order to ensure an effective classroom interaction in English (Wu, 2013). This would align the practices of the oil drilling department with the requirements of the recently adopted English as a medium of instruction. This concept is better supported by Costa and Mastellotto (2022), who highlight "the potential of ESP to prepare students in EMI communication, support academic disciplinary skills, develop transversal skills, and foster intercultural communication" (p.37).

Teachers' Evaluation of Oil Drilling Students

Students were evaluated as less motivated and engaged in physical sessions of ESP by the ESP teachers in the target department. This entails a pressing need for improvement and reforming its educational approach. A similar situation is depicted among Algerian ESP students by Boudersa (2018), who recommends increasing the coefficient of ESP and design more specific-field English curricula to improve the value of ESP courses.

On another side, this lack of learners' engagement in ESP classes means that ESP teachers still play the conventional roles of the instructors: Preparing the lesson, presenting it, engaging learners in learning activities for more practice, and then assigning them some sort

of homework. However, learning approaches have to be adjusted to meet the demands of the digital age (Cowie & Sakui, 2013). ESP teachers need to address the challenges caused by the impact of technology on communication and work culture as well as to manage the changes in higher education (Vavilina, 2020). Students are no longer constrained with physical classroom walls on predetermined administrative schedule, but rather, they are enabled to learn wherever they prefer using several devices and platforms (Chen et al., 2014).

Consequently, instructors are required to adapt their teaching methods to address those demands. In this context, the flipped classroom has attracted increasing attention as a modern teaching approach in English language classes, notably in English for specific purposes instruction (Liu et al., 2022). This teaching model aims to foster developed a culture of learning among learners instead of working for the completion of assignments (Bergmann & Sams, 2012). The preceding highlighted measures are intended to enhance learners' engagement in the learning process.

Instructional Materials

The dependence of the more experienced teacher (Teacher B) on digital technologies indicates that the teaching experience led to this conviction to work for more effective and productive learning of ESP in the current era. According to Teacher B, falling back on the adoption of online learning aims to address the learners' regular absences from English sessions in science and technology fields, whatever causes could be (employment commitments, health problems, family responsibilities. etc).

This measure stands in consistency with the claim of Bergmann and Sams (2012) who have developed the FCM to make the learning content for those absent learners. Similarly, Motteram (2016) affirms that the use of digital tools and resources at any time minimizes the necessity of presence in the physical classrooms unlike the traditional ones.

Besides, both participants affirm their dependence on digital channels and internet in a way or another in their courses. This indicates the inevitability of using digital technologies in the current era. However, teachers have to be able to effectively evaluate materials before being used (Motteram, 2016). Therefore, employing technological devices in language e-learning process becomes increasingly frequent, but it requires educators' expertise in e-learning (Cowie & Sakui, 2013). This point is further explained by Woodrow (2018) who emphasizes the course designers' need to be cautious not to use technology only for its novelty. According to this researcher, in some cases, traditional materials are likely to be more appropriate considering the target course and audience.

Types of Learning Activities

Both interviewed teachers confirm the significance of communication in learning English, either through web-based channels discussion or activities which stimulated interactive communication such as conversations. These findings indicate that the passivity of learners is unacceptable and suggest recommendations for engaging them in real-like communicative situations, enabling them to use English specific to the field of oil drilling. Our research finding in this context complies with Chen et al. (2014), affirming teachers' response to the technological progress through adjusting their teaching strategies to satisfy the needs of the digital natives to engage in international academic events.

Homework and projects as tools unveil differences between the two interviewed teachers, notably because of their practical experience as well as their academic qualifications. The more experienced engineering teacher (Teacher B) realizes that learners commonly give less importance to the subject of English because of its secondary status as interdisciplinary module with low coefficient, compared to the remaining fundamental subject matters in the Hydrocarbons Faculty. That is, it plays a less significant role in determining the success of the learners. Therefore, this teacher shows satisfaction with the time dedicated for

teaching English. In addition, the experience Teacher B has in this faculty makes him certain that the majority of learners would not be interested in doing any homework. So, he does not assign such activities.

Conversely, the novice EFL teacher (Teacher A) transfers some sort of homework or projects to be done by the learners outside the class time frame as an attempt to make them aware of the importance of English in the field of hydrocarbons as well as university studies in general. The interpretation of these findings indicates the necessity of solving the problem of learners' lack of interest in English coupled with the change of its status from second foreign language to become the language of instruction in the Algerian higher education. Additionally, those activities have to develop students' engagement and address students' specific needs (Boudersa, 2018) and foster self-learning taking advantage of technology (Asmalı, 2018). This practice best describes the objectives of the focus of flipped classroom model integration which depends on autonomous engagement with digital content outside class time and get involved in discussions and hands-on activities during face-to-face classes (Bergmann & Sams, 2012).

Online Education Modalities Employment

Teacher B, experiencing teaching during the pandemic spread, states that Covid-19 has been a turning point in the Algerian higher education context by officially integrating online education. This view aligns with Guemide and Maouche (2020), who claim that this modality ensured continuity in learning during the widespread closures of the educational institutions. Since then, academic research sheds the light on the possibility of adopting different types of e-learning. Anderson and Dron (2011) contend that effective e-learning implementation is guaranteed by the presence of appropriate technologies (e.g. conversation-pedagogies are enhanced by the presence of two-way communication channels; conferencing channels require high expenses to fund its infrastructure, including hardware, software,

internet connectivity and digital literacy). Cowie and Sakui (2013) emphasize the significance of teachers' expertise in e-learning, which can be gained through professional training. The practicality of fully online and hybrid classes becomes effective with the widespread internet connectivity (Healey, 2016). However, online education modalities such as blended learning and flipped classroom model needed an in-depth research and implementation in order to understand all consideration of their effective implementation. The current study was a case in point.

In the Algerian context, Teacher B affirms the claim of Guemide and Maouche (2020) that the digital platform named Moodle played a vital role in the shift from conventional to online education. Accounts for learners have been created there to ensure their access to the teachers' uploaded lectures. Throughout time, research has been conducted and emphasized the potential of a variety of digital tools and resources. The researchers, teachers and students have become familiar to the use principles of Zoom and Google Classroom for video conferencing and online discussion as well as Google Docs for collaborative work (Guemide & Maouche, 2020).

Assessment Techniques

The assessment techniques employed by both ESP teachers generally unveil a tendency of sticking to traditional methods of exams and tests, standing in alignment with the findings of Benmihoub and Boukhedimi (2019) while conducting a study about the impact of implementing a dynamic approach in assessing as a way to enhance critical thinking skills of higher education students. These researchers affirm that traditional assessment regularly fails to foster learners' critical thinking and creativity. As for the Dynamic Assessment they apply, it combines assessment and instruction, relying on interactive and supportive learning experiences. Accordingly, this assessment approach proves effective at enhancing student engagement and learning outcomes in EFL classes. A contribution to enhance assessment in

higher education English classes comes from Megnounif et al. (2013), putting emphasis on using efficient assessment techniques to improve teaching quality and bridge the gap between learning outcomes and industry requirements. Their research shed the light on the need for coherent evaluation systems that uses continuous feedback for both students and teachers such as surveys. Consequently, the previous two studies give evidence that assessment techniques should be used in a way that reflects modern educational practices with the aim of enhancing learning. Therefore, Bergmann and Sams (2012) affirm that the advantages of assessment can be maximized through "leveraging modern technology to provide valuable feedback to our students" (p. 85), being supported by implementing FC. Interestingly, training for the use of modern assessment strategies is needed (Kerras & Salhi, 2021).

Teachers' Technological Literacy Level

The findings exhibit that the participating teachers think that they possess an excellent level of technological literacy, owing to their daily use of such tools, reflecting Prensky's (2001) coined terms of "digital natives" and "digital immigrants". This would enable them to conduct online courses and integrate digital learning modalities. The technological advancement, notably digital tools and resources, offers multiple opportunities to access authentic materials, practice language and support autonomous learning through live interactions with experts of the target discipline along with producing resources and practicing language (Charles & Pecorari, 2016).

However, Dudeney and Hockly (2016) assume that those individuals are competent in all technologies or 'tech savvy' simply because they heavily rely on mobile phones, but rather they need to acquire the digital literacies or 21st century skills. To that end, continuous specialized training in this domain is much recommended in the context of the immense and rapid technological advancement to meet the needs of the digital-native learners. This finding reflects the work of Kessler (2016), which affirms the increased interest in preparing language

teachers to integrate technology in their educational practices and enabling them to evaluate the appropriateness of those tools and resources.

Students' Challenges with English Proficiency

Once again, the academic background of the teacher seems to affect their professional career, standing in consistency with Hyland (2007). The latter contends that academic background of teachers has a significant influence on ESP teachers' instructional practices in determining teaching methods and selection of discipline-specific content meeting learners' communication needs. In our study, Teacher A- the EFL teacher- focuses on linguistic components, i.e., teaching language itself using oil drilling topics to contextualize learning. By contrast, Teacher B -belonging to engineering backgrounds- focuses on teaching language as a tool not an objective to reach language proficiency. In the latter's view, all learners need the language that would enable them to communicate effectively in their academic discipline.

Both participant teachers agree on the type of the causes causing difficulties among students when learning English, including insufficient exposure to spoken English in authentic contexts along with the lack of opportunities to regularly practice and use English. Their observation is in agreement with the study of Guo (2012), which proves the positive contribution of regular practice and use of English on enhancing of learners' English proficiency level. Besides, acknowledging those problems prompts these teachers try to change the situation, having a similar attitude to many educational scholars who contend that learning approaches must be transformed to align with the demands of the digital age (Cowie & Sakui, 2013). The widespread use of mobile devices along emergence of the social web have caused a crucial transformation in how people communicate with one another, consequently impacting language learning approaches, and hence, created new opportunities for language learners by their ability to connect, interact, and learn with the languages in creative and unprecedented methods (Healey, 2016).

However, the interviewed teachers believe that these challenges arise not from the content they present, but rather from their students' insufficient motivation and varying proficiency levels within the same class, reflecting the ideas of Enesi et al. (2021) which address such obstacles for language learning.

To sum up, the insights drawn from 'pre-intervention Teacher Interview are in favour of integrating modern technology-based teaching approaches in ESP classes. First, web-based technology would guarantee sufficient exposure to authentic language learners. Second, experiencing both teaching approaches leads to a preference of online modalities and acknowledge their efficiency. Third, engaging learners in scientific research and publication would depend on being digitally literate to access and utilize online resources productively. In addition, online learning increases the motivation and interest of ESP students. Moreover, educators are unconsciously adopting flipped classroom techniques, dividing the session into in-person for lessons and hand-on activities on one hand and homeworks sent via digital tools on the other, depending on digital communication tools (email), social media (facebook), and learning platforms (Moodle). Furthermore, learning skills are recognized as important, including communication, critical thinking and engagement. They are, in essence, the primary focus of the creation of digital teaching approaches.

Given the preceding findings, the current section addresses this research question: What factors should be considered to determine the effectiveness of FCM in enhancing interest of oil drilling students during English sessions? It identified the following key components were: Communication using oil drilling specialized language, incorporation of authentic instructional materials in real-world or simulated contexts, and providing opportunities for increasing the target students' motivation and engagement in self-directed and experience-based learning as well as encouraging collaborative learning. That is, the

current research could evaluate the level of FCM effectiveness by considering the preceding factors.

In the subsequent sections, we tried to answer the following primary stated research questions:

- To what extent will FCM prove effectiveness at designing and teaching English for Oil Drilling students at Kasdi Merbah University?
- How will the attitudes of Oil Drilling students and teachers at Kasdi Merbah University be towards FCM?
- How will FCM address the specific needs and preferences of adult learners?
- To what extent will the implemented teaching approach align with the 21st century skills among learners?

6.2. Insights Gained from Observing Online and In-Class Phases of the Flipped Classes

Classroom observation in the FC entails not only the face-to-face part of the lessons, but also the pre and post online phases. These phases effectiveness is measured through the elevated learners' engagement and motivation. These criteria are gained from the insights of the study of Hsiao et al. (2023), evaluating the efficiency of implementing FC approach in ESP classes. In the present research, classroom observations are conducted with the aim of exploring the extent to which the FCM satisfied students' needs and investigating its success as an educational approach in the Department of Drilling and Mechanics of Oil Fields.

6.2.1. Students' Engagement during the Online Class Phases

Students' participation rate is extremely low during the online class phases. The likely reasons for this situation may be that the participants find the tasks challenging. Another possibility may rise from technical troubles hindering learners' access to pre-sessions' materials and activities. One more probable cause leading to such findings could be lack of motivation and interest in the session of ESP on the part of those data providers. Lack of

incentives or inappropriate timing of the assignments could emerge as other reasons. Whatever causes of this low engagement were, the situation would be better explained by the learners themselves in the post study questionnaire. Understanding such causes would unveil details into students' engagement and cooperation in face-to-face ESP sessions and pre-class assignments. It would also suggest potential improvements in the targeted course design and teaching.

6.2.2. In-Class Observations

Disengagement and Absence

Teacher A undertook continuous initiatives and interventions to support students' engagement in communication. However, there was a little engagement on the part of a small group of students. In other words, there is a significant disconnect between the teacher's dedication and the learners' willingness to take part in the learning process. This shows alignment with the findings highlighted by Kaouche (2022). Yet, our findings are in contrast with the findings of Guessabi (2021) which demonstrate resistance to FC implementation. The source of this resistance stems from study participants' belief that this methodology contributes to increasing the rate of absenteeism by enabling them to access the instructional content outside of in-person classes. This claim is also proved by our observed significant portion of student absences. Disappointingly, there is a lack of responsibility among a small group of trouble-makers who created noise at classroom and had a tendency of speaking. In our study, the reasons for this situation are determined by revisiting and further investigating this point when administering the post study student questionnaire and ESP teacher interview.

Moreover, the results of this research tool affirm the previous findings of teacher interview in our study. They are also in compliance with the study of Boudersa (2018), demonstrating lack of learners' interest in in-class ESP sessions. Nevertheless, the level of engagement, comparing the in-person sessions, has witnessed a slight improvement. Our

findings are supported by those of the study conducted by Larbi and Zitouni (2021), indicating inconsistent learners' motivation upon implementing while gaining positive acceptance as a teaching method for its impact on increasing learners' engagement.

Learner-Centered and Facilitated Teaching

Additionally, the findings indicate a highly efficient implementation of learner-centeredness principle among the small number of the most participating learners, accompanied by a balanced instructor's guidance. In addition, the course prioritizes students' contributions and engagement. By providing enrichment and remediation after each incorrect or inconvenient answer and avoidance of any clarifications of the activities, Teacher A reflects a clear understanding of FC methodology implementation and efficiently plays the role of a facilitator, addressing specific students' needs as they arose, rather than being a prevalent practice. This effective application of FCM is due to the guidance we provide and the detailed steps of the lesson plans, the fact that indicates a necessity for teachers training. This goes in compliance to the perspective of Kessler (2016), pointing out the vital role of qualified language teachers in enriching the learning experiences and opportunities. Another support to the need for teacher training to effectively apply FC comes from the recommendations of Larbi and Zitouni, 2021).

Thus, the designed flipped course efficiently applies the fundamental feature of FC approach as explained by Bergmann and Sams (2012) in redirecting "the attention in a classroom away from the teacher and onto the learners and the learning" (p. 96). These developers of FC emphasize the upcoming responsibilities assumed to learners: Engaging with digital materials in the pre-class phase, apply the acquired knowledge by completing in-class tasks, and effectively investing the teacher's expertise to enhance their content understanding through asking insightful questions and seeking feedback. Besides, our study limits the role of the ESP teacher to fit that described by Bergmann and Sams (2012) in the

FC “to help students, not to deliver information” (p.17). Therefore, our study conforms to the definition of teacher-student new roles by Healey (2016), who stresses the inevitability of this continuous change with the potential access to learning resources autonomously via technology.

Fluent Learners Meeting Shyness

Though a high level of shyness to participate was observed, the participating students have a prominent level of pronunciation perfection as well as fluency allowing them to clearly communicate their ideas and provide their answers. This affirmed the findings of the pre-study questionnaire identifying the advanced level of the majority of the study participants. In addition, our findings show conformity to those of Rahmani and Zitouni (2022). The latter shed the light on several psychological challenges faced by students in flipped classes hindering their participation and communication during face-to-face sessions, including fear of judgment and anxiety. However, these factors start to decrease as the study course gets longer due to their familiarity with their peers and the learning environment, leading to increased interaction. In our case, the source of shyness tendencies could be explained by the participating students with the volunteering teacher or teaching method. So, a longer study course is needed to decide about the impact of this factor. Additionally, the awareness of existing pronunciations can cause such shyness. In other words, regular exposure to English extracts made them aware of the differences between the native speakers’ pronunciation and theirs. It could also stem from a fear of not being perfect. Be that as it may, the findings of the post study questionnaire would clarify the real reasons behind this predominant phenomenon.

Ongoing Classroom Assessment for Enhancing Learning

The classroom practices of Teacher AA also showcase ongoing guidance to maintain students’ attention and interest throughout the lesson. They include techniques such as comprehension checks, rather than relying on one single summative evaluation strategy. This

observation is supported by Bergmann and Sams (2012) affirming that educators need to use supervision methods to check learners' effective engagement with the target content both online and in face-to-face sessions.

These assessment techniques provide opportunities for the educator to make immediate adaptations to the lecture pace and to maximize learners' attention. Accordingly, Bergmann and Sams (2012) provide the example of 'students' notes' to illustrate this point. Notes can be presented in different forms, such as paper notes, posting comments on a blog or emailing instructors to ask for any misconceptions. These notes enable the regularly engaged, shy as well as disengaged students to interact about the target knowledge. They also increase learners' confidence to participate in typical classes. Another technique is suggested by Cronin and Coakley (2018), requiring teachers to plan to ask insightful questions to their students to check their understanding. On more assessment strategy in flipped classes is grading in-class activities to improve learning through providing valuable feedback to the students (Roehling, 2018).

Learning Skills of 21st Century Education

The current designed course focuses on creating situations for debate through asking questions to stimulate classroom participation and summarizing key points of the texts. Skills such as communication, critical thinking, problem-solving, and digital literacy are observed in the most actively engaged and motivated learners. That is, the designed course is effective in creating the 21st century learning environment described by Živković (2021), which entails engaging learners in higher-order thinking skills.

Yet, a lack of collaboration is observed in doing tasks, meaning that our findings do not totally conform to collaborative learning as one of the key pillars of FC as established by Bergmann and Sams (2012). The latter affirm that team work proves effective in enhancing the quality of learning. In addition, they affirm that FC encourages 21st-century education

which requires learners to work and solve problems in teams to be prepared for professional settings where people rarely achieve tasks in isolation.

However, physical class sessions mark a deficit in self-responsibility towards one's own learning among some learners. This finding is inconsistent with the claim of Agarwal et al. (2019), which emphasizes the impact of student accountability towards active engagement in the learning process on creating more successful learning experience. Agarwal et al. (2019) use an e-tool called TalentLMS to encourage students to take responsibility for their own learning outcomes. This tool maintains ongoing control over students' activities, notably tracking the time spent on viewing learning content and quiz achievement.

Presented Flipped Lessons Level of Effectiveness

With respect to the in-class sessions, FC proves to have two effects: effective and failure points. With regard to positive side, the course succeeds in increasing enthusiasm and engagement among the most committed learners. Likewise, it slightly impacts another small group of previously passive learners. It involves learners in situations where different learning skills are actively applied. In addition, the learning objectives are clearly set throughout the activities and texts. It also provided opportunities for learners to reflect on their own learning and comprehension. A further point to consider is that the whole time of the sessions is devoted for practical hands-on activities, with no traditional lecturing of lesson content.

However, the suggested flipped course fails at engaging most of the learners. Additionally, it does not overcome the reasons of passivity of the majority of learners. Empowering learners to take risks seemed to be a hard task. Another important point to consider was its limited ability to convey the importance and applicability of the English course and subject matter, mainly as it has become a medium of instruction. The in-class sessions seem to be totally isolated from the pre-class phase content.

The findings of our research can be supported by those of the study conducted by Pavlova and Valeeva (2019), where they implemented FC in ecology Master's classes. Theses researchers point out that they fail to involve all students to achieve learning activities. They also outline a number of challenges faced while implementing FC such as learners' laziness in completing homework, insufficient self-organization, and resistance to change of teaching approach through adopting FC. These researchers opt for the use of a reward system to overcome these challenges, including the creation of more individualized assignments to maintain engagement of both active and passive students. Unfortunately, they observe a continuous high passivity among some learners, indicating unpreparedness for autonomous learning. Further strategies are used by these researchers to motivate all students such as more diverse forms of instructional materials along with the creation of a system of bonus points.

With regard to the adherence of the presented sessions to the norms of in-class phase of FC, these sessions show compliance in the way Teacher A transitioned smoothly between activities, in keeping the same pace in the delivery of the lessons' content and instructions and allocating sufficient time for discussions and student engagement. The most prominent criterion of a flipped class is there by allowing learners to use the digital tools and resources during the class time as a support for doing the tasks and expressing their ideas in written expression.

In conclusion, the findings of online phases practices and classroom observations depict an adherence to in-class principles of FCM. However, its full potential would depend on overcoming the challenges constraining its implementation. Understanding the underlying causes behind the faced difficulties would be crucial in developing a supportive, engaging learning atmosphere, and hence, guaranteeing its effectiveness. The upcoming section seeks to identify the main factors causing those challenges.

6.3. Discussion of the Post Study Findings

6.3.1. Post-Study Student Questinnaire Findings

The findings of the current section are gained from the post study student questionnaire and teacher interview. They are discussed in relation to their compliance to the underlying characteristics of the FCM. They aim at answering the remaining central questions of the study and determine whether it is effective in designing and teaching a course for oil drilling students in the context of Kasdi Merbah University.

The number of the engaging students in the study is even lower than the pre-study questionnaire. This phenomenon could be attributed to a lack of interest in ESP, as previously stated by the ESP teacher (Teacher B). Another reason causing this situation could be their advanced level so they are not in need of any English course. Additionally, they could be preoccupied with other life commitments, such as work. Further research could be conducted to unveil the real causes behind such reluctance to participate in ESP classes.

Attitudes of Oil Drilling Students towards FCM

This section answers one of the current research questions addressing the attitudes of oil drilling students at Kasdi Merbah University towards FCM. The upcoming points present the aspects of FCM in relation to those attitudes:

- **Positive Impact of FC Pre-Class Digital Materials:** The respondents believe in the positive impact of FC pre-class digital materials on the quality of their understanding of the subsequent in-class learning content, practice and personalized learning. Put it differently, learners are equipped with the prerequisite information needed in the physical class. They are able to reinforce their studies by selecting suitable content and access it at their preferred time and location. Concerning this positive attitude towards the impact of viewing pre-class content on the in-class practices, this study proves compliance with the findings of Agarwal et al. (2019) and Kaye and Kim (2023), emphasizing the significant

role of pre-class preparation in enabling more effective engagement during in-class phase. Despite our study participants' positive attitudes towards FC, conformity in findings is relative when compared to their practical active engagement which remains low.

- **FC Enhancing Retention of Course Content:** FCM is found to be more effective in maximizing the ability to remember the course content than traditional instructional approaches. This can be explained by enabling students to learn at their own pace, pause, rewind and access videos or any other learning content for effective retention. These findings are supported by the study of Li and Peng (2022) indicating engagement with out-of-classroom content improves the cognitive learning processes of retention and understanding.
- **FC Reducing Studies Boredom and Pressure:** FCM, having an online part, is found to decrease the studies' boredom and pressure. Access to a diversified and self-paced content would lead to unconscious and effortless learning. Nevertheless, these findings stand in contrast with the claim indicating that engaging students in pre-class assignment resembles the traditional requirement of learners to do homework and causes the feeling of studies overload (Chen Hsieh et al., 2017). This view is also supported by Roehling (2018), yet, they suggest the strategy of 'free pass' to reduce the pressure of workload. The practice of 'free pass' prevents students overwhelmed by other responsibilities from being penalized for not completing pre-class assignments.
- **Pre-Class Equipping Learners with Necessary Knowledge and Skills:** This phase of the FCM is viewed as a practice that equips learners with the necessary knowledge and skills and empowers them to actively practice during the in-class sessions. In other words, it prepares them for more practice during the class time frame. Supporting this perspective of the participating students, Roehling (2018) affirms that educators have to require learners to achieve pre-class learning assignments to be more prepared for the in-class

phase. Otherwise, learners not hold accountability towards those assignments will fail to be ready for the subsequent learning phase. Roehling (2018) affirms that some sort of incentive will maximize students' motivation to engage with the pre-class digital content.

- **Positive Attitudes about FCM Digital Phase**: Another significant point to highlight is the respondents' positive attitudes about FCM digital phase despite the recorded low rate of engagement in achieving pre-sessions work as well as practical in-class tasks. The reasons could be due to their lack of acquaintance with the substitute teacher whose mission was temporary as volunteering for sake of implementing the current research. That is, the study should be longer or done with their original teacher to avoid such extraneous factors. This could also because of watching the pre-class videos and viewing the content of the associated activities, without actually submitting the written answers. A further possible explanation could be that their perspectives are shaped by their prior experiences with similar teaching methods in their other academic contexts. For more reliable findings regarding the causes behind such positive attitudes of students towards the digital pre-class phase, further research is recommended, narrowing the scope of this research and working for reducing the impact of any extraneous factors.

Challenges in Virtual Stages of FCM

Revisiting the previously tackled issue related to the main reasons behind learners' low rate of engagement, the findings of the student post study questionnaire focus on the low or unreliable internet as the fundamental challenge for the lack of participation and engagement of students in the virtual or digital stages of FCM. Based on the researchers' firsthand experiences, this is due to the lack of internet connectivity coverage in the university campuses. Another explanation for the observed phenomenon could be the financial constraints confronted by the students. Since the majority of the sample members were found to be at exclusive student age, without any work or financial resources to afford reliable

internet access and availability. The challenge of internet availability hindering an effective implementation of FC is also emphasized by many studies that tested the efficacy of FCM in the Algerian context, including Larbi and Zitouni (2021) and Rahmani and Zitouni (2022).

Complementing this, the other challenges were not a big issue for the surveyed students, meaning that they were digitally literate. Putting it differently, our findings validate one of the research primary hypotheses, entailing that digital native learners having the necessary digital skills will prefer the integration of digital technologies and tech-based teaching approaches in the oil drilling field of study. The reasons for that are: they are digital natives and the nature their field of study of science and technology branches. No or little problems are caused by navigating or understanding the online learning interface, accessing online learning platforms or using software or tools, etc. These findings are supported by the research of Kaye and Kim (2023) and Bergmann and Sams (2012), emphasizing that digital literacy enhances active engagement and participation in online learning experiences of FC. Conversely, the study of Guessabi (2021) reveals students doubts about the effectiveness of FC digital content and their preference of traditional teaching approaches, despite its recognition of the advantage the online phase of FC in providing the learning content to those unable to attend the in-person sessions.

Reasons for Absenteeism from In-Person ESP Sessions

The reasons for absenteeism from the physical ESP sessions confirm the hypothesis that FCM will meet the needs of the target student as adult learners. The findings provide relevant insights in this regard. The major reason for learners' high rate of absenteeism among oil drilling students in ESP classes is their conflicting schedules and commitments to the scheduled face-to-face ESP sessions. FCM is agreed on as a solution for such problem through allowing the delivery and learning of content outside of physical classes. This view shows compliance with that of Chen et al. (2014), indicating that learning activities delivery

in contemporary higher education classes extends the physical classroom boundaries, and occurs at any time and any place. That is learners' absence from face-to-face classes would not negatively affect their learning experience. However, our results do not conform to those of Guessabi (2021), which consider the concerns raised about the possible negative contribution of FC in increasing learner absenteeism, due to their reliance on pre-class digital content provided by flipped classes. This would lead to missing the practice of the acquired knowledge and the opportunity to engage in discussions, which are integral components of FC model.

Alignment with 21st Century Skills

The findings show that the students are generally self-disciplined and responsible for their studies, considering their resistance to the distracting effects of social media (e.g. Facebook, Telegram) and other virtual activities unassociated with the online session of English while viewing the online pre-class material. These findings are not in accordance with those of Hollis and Was (2016). The latter highlight the negative impact of technology and social media on learners' concentration and academic performance. These researchers suggest a number of strategies to limit the distractions caused by technologies, including limiting the time spent on social media platforms, creating an interactive learning environment, etc. These findings are in accordance with those of Dontre (2021), who contends that increased media multitasking causes poorer academic outcomes. To sum up, the findings of our research are positive and further research has to consider the potential negative effects of technology on learners' attention and focus.

In the context of the alignment of the designed flipped course to requirements of the 21st century skills, research question number five is answered. This research question intends to evaluate the effect of adopting FCM on promoting the 21st century skills among the target learners. When dealing with the major reasons for learners' absenteeism, their absences are

not arbitrary, but rather linked to particular factors, notably personal or health problems. Again, this reflects their responsibility towards their studies. Moreover, the respondents did not indicate lack of awareness or administrative communication about the benefits of face-to-face interactions as a reason for their absenteeism in ESP classes.

Furthermore, the findings reveal that the target students have no problem with the interest or motivation in the ESP subject matter. They seem to be in contrast with the previous data gained from teacher interview as well as the study of Boudersa (2018), stemming the absenteeism cause to the lack of interest in ESP sessions. In fact, it is not a contradiction since the study sample is selected on the basis of tendency of presence in English sessions. That is, the questioned learners do not have a habit of absenteeism.

In addition, findings indicate that sample members face no issue neither with the sufficiency of clarity or understanding of the instruction needed for ensuring class participation, nor having any difficulty in understanding the relevance or applicability of the ESP content. These data conform to the previous findings obtained from the pre-study student questionnaire, demonstrating an excellent proficiency level of English for the majority of the surveyed students. Another view supporting these findings is that of Parkinson (2012), who affirms that students in science and technology disciplines must acquire targeted literacies and genre conventions knowledge specific to their fields of study. Further, this researcher affirms that these academic disciplines necessitate sufficient level of English proficiency to effectively engage with their courses. English is also described as one of the core subjects of the 21st century education by Boukersoul and Sadoune (2024) in their description of a framework called 'Partnership for 21st Century Skills', which outlines the fundamental skills (communication collaboration, critical thinking, digital skills, etc) as well as the fundamental subject matters (English, Mathematics, etc) required for students' success in the 21st century.

Now more than ever before, English has gained more significance with its promotion to be a medium of instruction in the Algerian higher education context.

In conjunction with the learning skills, the majority of the study participants opt for confronting no difficulty when engaging in learning independently during the virtual pre-class phase of FCM. That is, they acquire the skill of autonomous learning. However, a longer study period is needed to decide whether this skill is developed by the implemented flipped course or by the nature of their engineering studies as highlighted by Duarte (2015). The latter describes learner autonomy as a vital skill in engineering fields of study.

FCM Addressing the Specific Needs and Preferences of Adult Learners

This section of the questionnaire also offers an answer matched to the alignment of the implemented FC course to the needs of oil drilling students as adult learners. Some elements in this segment are repeated as consistency check questions with the aim of evaluating learners' awareness and reliability of their answers. Once again, the limited internet connectivity is highlighted by the research participants as a main factor for their lack of engagement in the online phases of the FCM. The second main character is the personal commitments or responsibilities. The lack of time availability for academic course is also stated as one of the main aspects leading to the low level of learners' engagement in the online sessions. These can be explained by the participants' nature as adult learners being occupied with other life responsibilities, and not being exclusively limited to university studies. These findings align with the key priorities of adult engineering students emphasized by Owusu-Agyeman and Fourie-Malherbe (2018), including the relevance of the teaching methods and programs and motivation to develop their knowledge and skills. Moreover, they comply to the key pillars of FC which suit their autonomous learning and engagement with the learning material at their own pace (Yeşilçınar, 2019).

This proves the hypothesis that adult learners would be better offered opportunities to carry on their academic career while being engaged with their life commitments. FC as a modern digital teaching approach would be the best solution for such situation, giving the chance for students to learn at their own pace, access digital instructional materials and lectures remotely and conveniently while balancing their studies with work and other commitments (Yeşilçınar, 2019).

However, the analysis of the data obtained from classroom observation proves that there is a lack of online activities performance. This is explained by the participants of the impossibility of their access to that content due to internet unavailability. That is, the flipped classroom provides different models to suit the circumstances of the learning situation as highlighted by Biggs and Tang (2011). This flexibility in implementing FC in various models is also described by the developers of the FC model Bergmann and Sams (2012) themselves a key strength of this instructional approach. Bergmann and Sams (2012) recommend providing offline resources provision for students with no internet connectivity before the next session. This suggested procedure suits our study, but we could not apply it due to the limited duration of our research.

Turning our attention back to our findings, limited English proficiency is not given that importance or focus as a cause for online sessions disengagement. This validates the findings of the pre-study questionnaire that most of the participants are of advanced or intermediate level. Putting it differently, the study participants have no problem with English language comprehension. The surveyed students link their low level of engagement in activities to their shyness or introverted personality traits which can hinder class participation. Learners' perspective is supported by Guzik (2019), stating that shyness negatively influences FC effective implementation as it hinders participation, social interaction and collaboration

needed for active learning and causes lower engagement and ineffective academic performance.

Once again, the findings prove that the respondents face no difficulties with the minimum level of English allowing them to understand the activities and lessons content. This is similar to the digital skills with which they confront no problem. The cultural barriers have an impact on engaging in the field of study since the beginning for the female students as highlighted by the findings of the pre-study teacher interview, but not for the use of technology for learning as confirmed by Wang et al. (2009), shedding the light on the differences between gender with respect to technology use, but without assuming any superiority of one gender over the other in this context.

In-Class Learning Atmosphere

Insights into the participants' evaluation of the in-class phase learning atmosphere highlight mixed views about the level of comfort for engaging in discussions and learning. That is, the findings suggest that FC succeeds in creating inclusive learning environment for a number of students, but also indicates that ongoing evaluation and improvement are necessary for maximizing active participation and comfort for learners with different backgrounds and experiences. In this vein, Rahmani and Zitouni (2022) point out that FC creates a positive learning atmosphere through stimulating learners' active engagement to view the instructional content and perform their assignments. They add that it reduces learners' anxiety through peer interaction and teacher support.

Sufficient Time Allocation for Covering the Course's Content and Mastery in FC

The findings shed the light on mixed perspectives regarding the sufficiency of in-class time allocation for covering the course content and achieving proficiency in English in their field of study. However, learners' familiarity with this teaching model principle will make them recognize that allocating time for studies depends on their proficiency and motivation

level for learning and viewing the pre-class material. This perspective is supported by Uzir et al. (2020), who contends the significance of efficient time management on academic performance. To that end, longer time frame for the implementation of the current study is recommended.

Level of ESP Teacher's Support and Guidance during the Implementation of the Course

The majority of the participants are satisfied with the role of the teacher as a guide of the learning process. However, the presence of responses viewing the support as moderately appropriate or totally inadequate points out to the importance of taking consideration of enhancing ESP teachers' practices. Consequently, these findings are consistent with those obtained from the analysis of pre-study teacher interview, entailing a pressing necessity for an effective training to equip educators with the required skills to properly implement FCM and address the varied needs of the target learners. This perspective stands in compliance to that of Rahmani and Zitouni (2022), recommending to offer a well-structured teacher training for a relevant implementation of FC as well as improving learning materials quality.

Skills Development and Application

The findings also denote that the respondents perceive the FCM as highly advantageous in enhancing the understanding of the subject matter and developing their critical thinking and problem-solving abilities. They also consider it as having relative potential at fostering their engagement, communication, collaboration during the course as well as their ability to select the instructional materials suiting them. In other words, FCM proves to have relative effectiveness in developing learning skills among learners. Similar findings are reached by Larbi and Zitouni (2021), marking positive attitudes towards the integration of FCM. Conversely, Rahmani and Zitouni, (2022) identify a set of positive effects of FC in the Algerian foreign language classes in the post-Covid-19 era, including

improvements in learners' critical thinking, self-paced autonomous learning, peer collaboration and accountability to their academic progress.

In the light of earlier insights, the designed course needs improvement as the main benefits of FCM are not all clearly perceived by learners. Ongoing evaluation and feedback on students' behalf regarding the flipped ESP course would find out areas for improvement. Ragupathi (2010) contends that students can offer their feedback about the level of clarity, engagement, and authenticity of knowledge addressed in the courses. Then, teachers can enhance the learning process by leveraging that feedback to comply their instructional practices with learners' needs and enhance learning outcomes.

As for students' feedback about collaboration during online phase, different perspectives are expressed regarding the sufficiency of collaborative opportunities. Those opinions range from an ample, a lack of such opportunities or a more moderate viewpoint. This indicates a need for redesigning the online tasks for a better implementation of FC course.

Acquired Skills Application to Real Communicative Situations

The majority of the respondents thought that they are able to put the acquired skills into practice in real communicative situations related to their academic discipline. This means that the course is moderately successful in meeting the ultimate goals of the ESP course as well as FCM. The former is developing learners' ability to communicate in English in authentic situations. The latter is applying the acquired skills to take greater responsibility and more active role in their own learning.

Yet, this evaluation of the course reveals that improvements are needed to overcome any inconsistencies in the application and opportunities to apply the acquired skills to support the transfer of learning to the industry context. Accordingly, this course evaluation highlights the need for improvements to ensure consistent adoption of the flipped classroom approach

through maximizing opportunities for facilitating the application of acquired skills to real-world situations.

Level of Satisfaction with the Content and Topics of the Flipped ESP Sessions

The findings indicate a high level of satisfaction and total absence of any dissatisfaction instances among the respondents regarding the relevance of the content and topics covered in the English learning sessions. That is, the designed English for oil drilling course succeeds in meeting the target students' needs and expectations. The neutral participants may require longer time to decide about the effectiveness of the suggested content.

Evaluation of the Overall Experience with FC Approach in the Designed ESP Course

After being involved with FC approach, the study participants' evaluation of their experience incline towards forming positive perceptions and no negative views though the time frame of the study was very short. Yet, a number of students maintain a neutral position. This is due to their uncertainty about this teaching method. They may need longer period of involvement with it.

Educational Approaches Preferences

Our findings are supported by the participants' teaching approaches preferences. The majority incline towards the integration of blended learning, rather than traditional or online learning models. This preference for a blended learning model complies with the principles of the FC which blends in-class activities and online learning components. By doing so, the learners support the reliability of their previous responses by recognizing the value of traditional in-person classroom instruction under the guidance of the teachers along with and digital learning aspects. This perspective goes in conformity to that of Bergmann and Sams (2012), stating that "although we know that the lecture is not the best means of communicating information to students, sometimes direct instruction has a place" (p. 109).

Delving further into the research findings for this section, a tiny number of participants prefer traditional classroom instruction. These views are similar to those found by Guessabi (2021), whose study reveals learners' favour of traditional handouts over technology. In our study, the remaining small group opt for online teaching modality. Thus, ongoing improvements concerning the application of FC practices are needed to cover all students' preferences regarding teaching approaches;

Readiness Level and Recommendation for Adoption of Modern Learning Approaches

As far as the transition to digitally-driven learning is concerned, the majority of the respondents show a high level of readiness to digital shift in education. That is, they form a positive attitude towards the adoption of digital methods in the learning environment. Yet, a number of students express uncertainty about the efficacy of the modern teaching approaches as they need to adequately try them to gain the necessary information leading to their embrace. The preference for conventional teaching methods may suggest a need for more awareness, training, and support in transitioning to innovative approaches like FCM. Interestingly, the majority of respondents (80.5%) recommend future use or adoption of the flipped classroom approach.

Impact of Coefficient Value on Participants' Motivation and Attitude towards ESP Classes

The findings of this study denote that the overwhelming majority of the respondents (71.43%) believe that increasing the coefficient of English will enhance their attitude and level of motivation towards learning English. This situation is better described by Assassi (2021), who indicates that Algerian higher education students lack motivation towards ESP sessions because they consider them as inferior compared to their academic specialty subject matters. This means that "teachers need to identify the kinds of incentives or motivations that will engage students in the instructional material and prepare them for the in-class activity"

(Cronin & Coakley, 2018, p. 80). In the same vein, “quizzes and guided reading questions are the most common incentives for completing pre-class assignments (Roehling, 2018, p. 5). Regardless of the defined incentive, the previous views emphasize the significance of using incentives to improve the quality of learning. Proceeding with our research findings, the remaining small group of participants (accounting for 28.57%) is divided between modest enhancement, neutral stance, and having no influence on their motivation and attitude towards ESP.

Strategies or Approaches to Enhance Interest and Engagement

With respect to the strategies that can be employed to improve learners’ interest and motivation during the ESP session, the respondents suggest very prominent ones. They can be rephrased as follows: Appropriate time schedule, sufficient time to cover the content, employing English as a medium of instruction to teach the content of all subject matters in oil drilling department, increasing the coefficient, more interesting by relating it to the engineering subject, Variety in the curriculum of English

6.3.2. Post study ESP Teacher Interview Findings

Concluding this section of findings discussion, the teacher's post-study interview provides insights into the instructor's attitudes, observations, and assessment of the effectiveness of FCM in ESP teaching. As mentioned previously, it was impossible to interview Teacher B because of other academic commitments beyond teaching in the target department. The findings of interview analysis are organized and presented in the upcoming points:

Attitudes towards Adopting FCM and the Designed Course

The insights drawn from the findings indicate that the ESP teacher develops an optimistic view on the adoption of FCM in the Department of Mechanics and Drilling of Oil Fields. Regarding the aspects ensuring the success of FCM, Teacher A affirms that the

implemented course proves effectiveness in designing engaging instructional materials, interactive activities, and requires learners to use their skills of communication, thinking critically and solving the problems lying in the learning activities.

Pertaining to the designed course, Teacher A evaluates it as clearly describing the steps and practices of flipped ESP teaching. It provides detailed presentation of lessons' procedures and effective selection of instructional materials. That is, a positive attitude is formed towards the implemented course for its supportive role. In this vein, Whetten (2007) emphasizes the importance of providing students with a meaningful learning model that enables them to construct knowledge, makes them active participants in the learning process, clearly states the learning objectives of the course design and aligning the learning activities and assessments with those objectives.

Requirements for Efficient Incorporation of FCM

The insights gained from interviewing Teacher A suggest that the integration of FCM requires digitally literate ESP teacher and students as it depends heavily on modern technologies. This view can be supported by the previously stated findings of this study emphasizing the significance of mastery of technological skills to engage in modern educational process. It is also in conformity with the perspective of Cowie and Sakui (2013), implying that learning approaches have to be transformed to respond to the requirements of the digital age.

The current research findings also entail a need for training ESP teachers by experts to implement FCM appropriately, showing alignment with the recommendations of Rahmani and Zitouni (2022). Additionally, they demonstrate the importance of devoting much time for the sessions of ESP to ensure better learning quality. Yet, Uzir et al. (2020)think that the time needed for effective learning within the FC framework depends on students' time management tactics. These researchers point out that students' academic performance is

enhanced depending on their ability to allocate time wisely to various learning activities. In other words, they are emphasizing the FC pillar of learner-centeredness.

Challenges with Language Teaching and FCM Implementation

As for the issues students face during ESP classes, the findings demonstrated that their problems do not generally stem from language problems, but with lack of confidence hindering their participation and use of language. Additionally, issues such as lack of engagement in online as well as face-to-face sessions along with the noticed slight noise during in-class phase, absence of teacher training in implementing FCM will negatively affect teacher's role.

As for the previous studies tackling those issues, Derouag and Sahli (2024) shed the light on a number of problems in ESP classes in the Algerian context including ESP teachers' lack expertise with specific subject knowledge and effective teaching techniques due to the absence of tailored teacher training. These findings are in total compliance to those indicated by our research.

In addition, Fadel (2022) outlines a number of challenges hindering the efficient implementation of ESP flipped classes, some of challenges align with our study' findings, while others do not. Both studies highlight the notable students' unpreparedness to engage with pre-class assignments. But, our findings oppose those of Fadel's study as the teachers participating in our research do not confront any difficulties in using technologies, face no time constraints that impede adequate management of class activities, and demonstrate no resistance on their part to shift to digital teaching modalities adoption.

Strategies to Create a Positive Engaging Learning Atmosphere

According to the findings, Teacher A recommends that positive learning atmosphere starts from setting guidelines for class behaviour. Another procedure to consider is encouraging students to communicate and be engaged in discussions using English, regardless of any

negative peer comments. Moreover, it is necessary to involve the target students in immersive learning activities such as projects. The latter requires oral presentations in English and collaboration with peers, mainly because these skills are crucial for their dissertation graduation preparation and presentation in the coming year of the target students. These recommended strategies for creating a positive engaging learning atmosphere are also provided by the study of Fadel (2022).

Presence and Participation in Flipped Face-to-Face Phase

As far as learners' presence in face-to-face ESP sessions is concerned, Teacher A contends that the reasons for students' regular absenteeism are predominantly matched to their low level of interest in the ESP sessions. However, this belief stands in contrast to the findings of the post-study student questionnaire, indicating that learners show a high level of responsibility towards their studies and their absences are not arbitrary and related to personal and health issues.

To compromise our findings, the excellent proficiency level of the majority the participants can reflect that level of absences as their learning needs are not met by the ESP courses they experienced during their academic journey. This idea is confirmed by Assassi (2021), stating that teachers' inconsistent assignments and inadequate course preparation lead to students' preference of other subjects over ESP. Thus, a longer study course is required for the implementation of FCM to find out the actual reasons for students' absenteeism from ESP classes. Based on further insights gained from Teacher A, this recommended period is also vital to confirm the suitability of the FC in addressing the conflicting schedules of ESP sessions with non-academic personal commitments are the causes of such disengagement of a number of students.

Reasons for Lack of Engagement in Flipped Pre-Class Tasks

With regard to the target students' engagement during the pre-class online phase, Teacher A affirms that internet unavailability is the primary reason leading to the noticed low level of online tasks achievement. Similarly, Berdiyorova (2021) considers the technological challenges related to inexistence of devices or internet connectivity as the main cause for the ineffective implementation of FC. Yet, this reason does not align with that of Yang (2021), who considers that the source of this low engagement in the flipped pre-class tasks stems from students' persistent resistance to any sort of homework, perceiving such assignments as workload causing an increase in study time. Roehling (2018) affirms that students will be unprepared for in-class practice if they are not held responsible for performing pre-class tasks. To overcome this challenge, this researcher highlights the significance of motivating students to do the target tasks using incentives, including the most common form quizzes and guided reading questions, on which we depend heavily in our designed ESP flipped course implemented in the current research.

Conclusion

As previously done with the analysis chapter and as part of the reflective process of action research applied in our study, the discussion of data is organized in a sequential flow: Moving from pre-intervention to post-intervention and from students' need, perspectives and experiences to teachers' feedback of the flipped learning process. This order helps better understanding of the interpreted findings and the impact of the study.

To sum up, the discussion section identifies key trends, relations, and divergences between the findings of data sources. In general, the discussion suggests that there is an inclination towards recommending the integration of the FCM in designing and teaching English for oil drilling course based on the predominantly positive attitudes reflected in the findings.

However, the pre-session and in-class phases are characterized by learners' disengagement, though there is a slight improvement. According to the findings of the physical classroom observation, this is due to learners' shyness using English and their peers' negative influence on the participants. Divergences emerge from the target departments' adoption of EMI without being totally ready. Training is necessary for teachers to be competent in teaching English for specialized engineering fields. In addition, being EMI does not change its level of significance among other subject matters. Low coefficient value, short allocated time for its instruction as well as its inconvenient scheduling time are factors leading to its neglecting by learners.

6.4. Implications and Recommendations

6.4.1. Summary of Findings through Addressing Research Questions

Research Question 1: To what extent will FCM prove effectiveness at designing and teaching English for Oil Drilling students at Kasdi Merbah University?

Strengths of the Current Flipped Course

In this section, we indicate the strength points of implementing FCM in the current oil drilling course. This is done through comparing the findings of the needs analysis questionnaire to those of the post study of the study participants. FCM -as an educational approach- succeeds in meeting a set of ESP learners' primary stated needs and preferences in the Department of Drilling and Mechanics of Oil Fields. They can be identified in the coming points:

- **Meeting Learners' Language Level:** The language of the course is mostly advanced to address the level of the majority of students and challenge the remaining ones. This aims at facilitating, reinforcing and maximizing the use of English language. Thus, new positive learning experiences replace any past unfavourable ones. According to this section's findings, an intermediate level is advisable to suit the majority of the study

participants and positively challenge those with low level in English to implicitly motivate them enhancing their proficiency.

This strategy also reflects the needs of all participants of avoiding the translation to their mother tongue for better understanding of ESP content. Focus is more on advanced aspects of language such as terms of oil drilling and refining pronunciation rather than learning the basics of English grammar or translation into mother tongue for a better understanding.

-**Emphasizing Principal Skills for Learners:** The implemented course emphasizes the skills of communication and cooperation, addressing the learners' preferences of learning skills required for enhancing their English proficiency in real world situations and oil drilling field of study. The presented flipped lessons excel at demonstrating learners' good pronunciation and their attempts to perfect it. In addition, those lessons motivate them to show an acceptable level of fluency.

- **Employing Authentic Appropriate Educational Materials:** The flipped course also depends on videos and authentic communicative materials in oil drilling field of study, allowing learners to enjoy learning English in the way they desire. This core technique of FCM proves effectiveness in teaching oil drilling English by providing appropriate and interesting content.
- **Maximizing immersive Opportunities for Positive Learning Journeys:** In the flipped sessions, opportunities of exposure as well as use of English language (pre-class videos and tasks and in-class hands-on activities) serve at encouraging learners to develop their active and independent leaning. Additionally, they aim at improving learners' confidence and overcoming any negative learning experience related to English language while reinforcing the positive ones. Furthermore, creating such communicative opportunities

enriches their lexical repertoire. In other words, it tries to keep oil drilling students motivated through immersing them in real or real-like situations**.**

- **Ensuring Access to the Educational Resources:** This flipped course provides thecontent in multiple formats through blending online and offline materials. By doing so, the instructional content becomes available for the absent learners and those without internet access. Thus, different learning preferences are satisfied.
- **Aligning with Student-Centered Learning:** The suggested course centers on students' active, interactive and collaborative learning, accompanied with teacher' guidance. This is achieved by incorporating learning activities which allow using English for: Summarizing, synthesizing and reporting of information; authentic communicative situations; academic discussions focusing on learners' discipline; reasoning and argumentation; and comparative analysis.
- **Using Ongoing Assessment:** In this flipped course, the ESP teacher uses ongoing assessment as a way to enhance students' engagement and maintain their attention. FCM provides sufficient opportunities for interaction with peers, ESP teacher and receiving feedback through opting for different types of learning activities, i.e. interactive learning. Those situations allow learners to reflect on their own learning and comprehension.
- **Stating Clearly the Learning Objectives for Students:** The designed online as well as face-to-face tasks and selected materials ensure the learning objectives are obvious.
- **Creating positive learning impressions:** The target learners and their ESP teacher describe their experience with FCM as excellent.

6.4.2. Shortcomings of FCM in the Implemented Course

As the implemented flipped course has proved successful in some certain aspects, it unfortunately falls short in several key areas. It fails at:

- Addressing the issue of non-attendance among students, both in in-person classes and virtual environments.
- Ensuring participation and engagement in both phases of FC, though learner centeredness is highly emphasized and applied. The participation rate was prominently low. It failed to engage most of the learners. Responses were predominantly limited to almost the same students each time, despite the slight observed improvement.
- Maximising learners' engagement and cooperation in achieving hands-on in-class activities and pre-class assignments.
- Creating an ideal comfortable atmosphere. This is reflected in the impact of peers' discouraging behaviour on the level of participation. This is also observed shyness among the most engaging students.
- Overcoming the reasons for passivity in some learners.
- Empowering learners to take risks in their learning journey to enhance their English proficiency and class engagement.
- Conveying the importance and applicability of the English course and subject matter, , even as English increasingly serves as a medium of instruction.
- Improving the status of English. Lack of interest is found to be highly related to the status of ESP as a secondary interdisciplinary subject matter.

Research Question 3: How will the attitudes of oil drilling students and teachers at Kasdi Merbah University be towards FCM?

- The participants form positive attitudes on FCM for its self-paced flexible learning, being equipped with the necessary materials for better engagement and practice in the in-class session.
- The participating learners and teachers show a positive sentiment towards the pre-class preparation phase is beneficial for enhancing the in-class practice. That is, pre-session

digital materials are effective in meeting the needs of the sample members at some key areas.

- The study participants favour blending face-to-face conventional interactions and web-based self-paced instructional practices. This will guarantee a balanced learning through learner centeredness and teacher facilitation. It is also indicated that FCM proves effectiveness in enhancing course comprehension and retention.
- In the same vein, they are in favour of FCM's feature of reducing the feeling of boredom and pressure of studies.
- Those participants agree that FCM cultivates self-directed learners who can independently take the acquired content and skills through the online components FC and apply them meaningfully in real-world, practical scenarios related to their area of study.
- The data providers take a favourable position for the possibility of future integration of the flipped classroom approach. This is because they highlight the undeniable use of technology as it has been already there in the target department, indicating that it becomes an integral part of the learning environment.
- The ESP teacher and students point to the potential of FCM in involving learners in in-class situations, requiring different learning skills. In conjunction of this, the participating teacher observes the slight increasing enthusiasm and engagement among the most interested learners.

Research Question 4: How does FCM address the specific needs and preferences of adult learners?

- Some participating learners show a high average of motivation, interest and engagement in the learning process by using FCM.

- They demonstrate the skill of autonomous learning skills through getting involved in learning activities without depending on their teacher for conventional explanations. The teacher opts for smooth transition from one activity to another as well as organizing the learning environment.
- Low level of engagement among some students due to their occupation with other life responsibilities. This group of the participating learners are unable to balance their studies with their personal occupations. Thus, they take advantage of the availability of digital materials on the provided link to Google Forms as well as the Messenger group to be consistent with their educational career.

Research Question 5: To what extent does the implemented teaching approach align with the 21st century skills among learners?

Though the implementation of the current course has not taken a long period, it has shed the light on some important aspects of modern teaching approaches. This flipped course shows some compliance with the 21st century skills. The upcoming points illustrate this concept:

- Learners show a certain extent of self-discipline and responsibility towards their studies. This is reflected in resisting digital or social media distractions while engaging with the online pre-class learning content.
- Responsibility towards their academic journey is also demonstrated in making an effort to avoid missing face-to-face sessions and being absent only with a justifiable reason.
- The implemented course necessitates possessing an acceptable level of digital literacy. Likewise, the respondents face no problem with the required skills to access the pre-class digital content.

- The active target participants engage at performing the hands-on in-class tasks as well as the pre-class activities, using skills of problem solving, collaboration and communication.
- They also possess the basic literacy skills which allow them to understand the learning content easily. It permits them to listen carefully, to read the written content and tasks, to write the answers, and to present them orally.
- However, these skills are observed and used by varying degrees by a limited group of the studied sample. More reliable findings on this issue will be gained with deeper and longer implementation of the course.

6.4.3. Research Implications

Based on the primary collected data, a course has been designed following the guidelines of FCM and implemented aiming at investigating its efficiency in ESP teaching. As an action research, the current study sheds the light on the existing problem related to the status of ESP in the Department of Mechanics and Drilling of Oil Fields.

The findings gained from this research are interpreted and reflected on to highlight their significance in this field of study and address any inconsistencies in teaching ESP there. The upcoming points will outline a set of implications for educators and policymakers to address the issues raised in the study:

- Support of English language teaching becomes a requirement in the target department, especially after adopting English as a Medium of Instruction in the Algerian higher education.
- In addition, the findings emphasize the significance of specialization in teaching ESP. It has a pivotal impact on the instructional priorities of the educators.
- A well-designed training program seems to be essential to prepare ESP teachers practice their profession efficiently in specialized fields of study as affirmed by

Boudersa (2018). Such training has to consist of equipping ESP practitioners with the appropriate skills, knowledge and approaches to implement the planned course. It will encompass the selection and development of teaching materials and resources as well as building engaging classroom activities. These requirements will respond to the needs of the target learners and objectives of the course, rather than to the teachers' backgrounds and preferences.

- Teacher training is identified to be very important in designing courses and manipulation of digital technologies to ensure high learning quality. That is, having training in modern teaching approaches emphasizing active and centeredness of learning.
- Another sort of training is essential to be implemented regarding the approaches of teaching, mainly those integrating modern digital technologies to meet the requirements of the digital-native learners. This aims at enhancing the effectiveness and quality of ESP teaching. In addition, it will serve at maximizing learners' engagement, motivation and responsibility towards their studies.
- This study implicates that the integration of digital technologies has become a must to be used in a way or another. For that purpose, the raising issue is conducting constant research for their effective integration in classes.
- It is of great importance to focus on maximizing the target students' motivation and engagement in the learning process, enabling peer collaboration, and encouraging independent learning. Adopting modern digital instructional modalities proves to be efficient in enhancing the learning process when they meet particular requirements in the field of oil drilling and engineering.
- The findings also illustrate the necessity of funding and designing intensive training for the teachers of English to successfully adopt English as a Medium of Instruction.

The initiative will empower teachers to use English rather than code-switching to French or Arabic.

- Coordination between English language teachers and content experts in the department is vital as learners express their desire to learn language specific to their academic discipline.
- Finding practical solutions for internet lack or absence of access or availability through techniques such as providing learners with pre-session offline materials and resources. Incentives in the form of free internet bonus for students can be provided. This solution can be supported by limiting the sites with open access for the students at university or university campus. Electronic devices can serve as a tool to ensure learners' access to course content, mainly pre-class materials and tasks.
- Implementing FCM effectively in a long time will solve the problems of Internet availability by providing offline pre-class materials previously. Participants contend that the unavailability of internet was the main cause for not achieving online tasks.
- Funding and organizing scientific seminars, researches and meetings to maintain constant improvements for teaching and employed digital advancements.
- Training for the use of modern assessment strategies and tools that align with modern digital teaching approaches.
- Enough opportunities for exposure to English in authentic contexts and engagement in situations where they practise it efficiently to communicate ideas, perspectives, views, expectations, perceptions, etc.
- Finding solutions for the attendance problem during face-to-face sessions and engagement with pre-class and post-class phases of FC. This implication intends to maintain some sort of obligation for attendance in the ESP sessions, without stimulating studies stress among oil drilling students. Examples can include:

mandating the target department to maintain electronic attendance registers for all students; relying on digital tools which require registration with emails to ensure resources access, communicate effectively; participate in online activities; offering incentives, such as participation marks. These procedures should consider the type of learners as adults being occupied with other responsibilities beyond academic pursuits.

- Lower status of ESP as an interdisciplinary module with low coefficient compared to the other fundamental subject matters in oil drilling field of study. Increasing its coefficient is agreed on by the target students as an effective strategy to improve its status, enhance their attitudes, and boost their motivation for learning ESP.

6.5. Recommendations

6.5.1. Recommendations for Future Effective Implementation of Flipped Oil Drilling Course

The study sheds the light on major considerations for improving the effectiveness of implementing FCM in the Department of Mechanics and Drilling of Oil Fields. The upcoming points are the identified recommendations:

- In case of replicating the current study, it would be wise to dedicate longer time for the implementation of the flipped oil drilling course to confirm about the impact of the flipped classroom intervention in designing and teaching ESP courses. This procedure will intend for overcoming any extraneous factors. It will also assist the researchers to get more reliable findings, along with convincing arguments and supporting evidence.
- It is recommended to utilize digital tools that allow for email registration and track learner engagement by identifying those who have watched the videos, even if they did not complete the associated activities.
- It is urged to conduct continuous evaluation, customization and adaptation of instructional approaches, practices and content to align with the varied learning needs

and requirements of the students. These guidelines can assist at providing a supportive, empowering in-class experience for all participants

- It is urged to provide digital training for teachers and learners is needed to ensure the adequate implementation of FCM, which can represent a significant departure from traditional instructor-centered classroom settings.
- To further improve the implementation of the ESP course within the FC framework's guidelines, the ESP practitioner needs an effective training in the ways of considering the following points: Gathering detailed feedback from students about class practices to understand the ways to support their specific needs and adjust guidance according to the varying levels of their engagement and principles of the FCM.
- It is advisable to provide some sort of incentives, as they prove to have significant enhancement of learners' engagement.
- Success of teaching ESP in oil drilling department seemed to have a little relation with the course content or teaching approach. Before thinking of the previously mentioned elements, it is better to identify the key factors that can change learners' attitudes toward ESP sessions. By that time, research scope can shift towards improvements and explore efficient strategies.

6.5.2. Recommendations for Further Research

Further research is needed to get better findings related to the implementation of FCM in the context of the Department of Mechanics and Drilling of Oil Fields. The subsequent points present the recommended suggestions:

- Continued research investigating the effectiveness of FCM will be essential to unlock its full benefits for learners.

- Narrowing down the scope of the current research to include only one variable affecting the quality of learning while applying FCM. Instances that can be covered are: The impact of

FCM on enhancing a specific 21st century skill such as maximizing learners' self-responsibility towards their studies; Implementing FCM using in teaching ESP employing only one digital channel (emails, social media, etc; Conducting research to find out the relationship between learners' age and the digital teaching approaches preferences.

- Conducting a study to evaluate the level of transition to English as a Medium of Instruction (EMI) in the Department of Mechanics and Drilling of Oil Fields, rather than focusing on ESP.

- Focusing on the extent of transition to English as Medium of Instruction effectiveness on the academic status and contributions of the target department on the international level.

- Designing a training course for teachers about the strategies of FCM and evaluate its impact on learners' fostering students' learning skills.

- Investigating the effectiveness of using modern assessment techniques on learning enhancement in flipped classes.

- Further research can focus on exploring the significant impact of incentives on learners' engagement in academic research and learning process.

Conclusion

In this section, the research findings are summarized and, based on the gained insights, implications are drawn and recommendations are suggested for better future implementation of FCM in the Department of Mechanics and Drilling of Oil Fields.

The findings of research are directly summarized, organized and aligned with the primary research questions. To start with, the current research highlights balanced strong and weak points of implementing FCM. With regard to second research question's focus, positive attitudes among the majority of target students and their ESP teacher are formed towards this teaching modern approach. As far as the principles of adult learners are concerned, motivation and engagement seem to be fostered with a slight level whereas self-responsibility is clearly

exhibited. When it comes to the last research question, the alignment of FCM with 21st century skills varies among the skills themselves on one hand and among the learners on the other.

In conjunction with the findings of the current section, implications for better incorporation of FCM in the selected department are presented. They target strategies for enhancing ESP teaching include specialization in English for specific purposes (ESP) and training programs for ESP teachers. This is coupled with provision of ongoing training in digital technologies and addressing internet access issues with the aim of fostering students' learning skills and effective incorporation of modern digital teaching methodologies.

With respect to the recommendations of the study, they are divided into two types: The first group suggests ways to enhance the effectiveness of FCM in case of its integration in the Department of Mechanics and Drilling; instances in this context encompass longer implementation time of studies investigating its effectiveness, using digital tools which allow students' engagement tracking in pre-class and post class FC phases along with funding training courses for both teachers and learners as well as conducting an in-depth research identifying the key factors causing learners' lack of engagement in ESP sessions being them conventional or virtual; the second set of recommendations emphasize the significance of narrowing down the scope of the current research in order to get more precise and reliable findings.

General Conclusion

General Conclusion

The study at hand explores the impact of integration of Flipped Classroom Model in designing and teaching English for Oil Drilling courses at Kasdi Mernah University. It aimed to determine the effectiveness of FCM in fostering students' communicative skills in academic and professional settings related to oil drilling field of study, evaluating the attitudes of students and teachers towards FCM, and its potential to create a supportive atmosphere for meeting adult learning principles and promoting 21st-century skills. Moreover, this research hypothesised that that ESP teachers and their digital native students' familiarity with technology use would lead to positive attitudes towards FCM integration in English for oil drilling courses. That is, flipped learning would positively influence the design and teaching of ESP courses, and the course would equip students with the requirements of the current globalized workplace.

Pertaining to methodology, this research opted for quasi-experimental pre-post research design for the impossibility of non-randomness of the target students' assignment into experimental and control groups. The latter also resulted in opting for purposeful sampling technique. In addition, data were collected through various research tools set in a specific order as they worked sequentially. In the pre-study phase, those data collection instruments included description of the setting, students' needs analysis questionnaire and ESP teachers' interview. Depending on the insights gained from those procedures, a course was designed and implemented, accompanied with classroom observations. In the post study stage, data were collected again via employing students' questionnaire and teacher interview.

The collected data were analyzed in various ways depending on the collection instruments. Both questionnaires were designed and analyzed using Google Forms. The interviews and classroom observation obtained transcriptions were examined using content analysis. The covered questionnaires' and interviews' questions along with the classroom

observation checklist items were organized into sections prior to their administration to ensure more organized research conduct.

A number of limitations were encountered during the implementation of the designed flipped oil drilling course. They hindered the smooth conduct of the study. Considerations were opted for to overcome those limitations. The first confronted problem was that the ESP sessions were scheduled to be totally online. So, exceptional face-to-face classes were planned in coordination with the department administration. The second problem raised from the extra commitments of the male ESP teacher, including engagement in academic promotion training outside Algeria. Fortunately, a volunteering female ESP teacher in the department substituted him in presenting the in-class content. Internet availability was another prominent obstacle for this course as it hindered a number of learners from accessing the pre-class digital content. Some other limitations are addressed implicitly as part of sections of the study such as recommendations and implications.

Coming to the research findings, they were addressed in a sequence of phases. The primary findings gained from pre-study tools were used to design the oil drilling course, coupled with learning activities and content adapted from already published workbooks in the domain of oil industry. The second set tackled the outcomes of research during and after study. In other words, the needs of the sample members, the experiences and perspectives of ESP teachers and the data gained from the description of the ESP status were interpreted in the designed flipped course.

Then, the subsequent outcomes were obtained from implementing the designed flipped oil drilling course. They were reflected on and evaluated by the volunteering ESP teacher and the students were observed and completed the questionnaire. The primary findings revealed that ESP teachers' practices were predominantly conventional. First, they played the greatest role at assuming the greatest responsibility in designing, preparing and presenting lessons

though the learning environment has changed after Covid-19 spread and it has become a medium of instruction. Second, there was lack of specialized teaching experience, training or guidance to design and teach a course. Third, no needs analysis was adequately conducted to build course depending on learners' requirements. In addition, interviewing teachers shed the light on the crucial role of experience on effective teaching of ESP, reflecting assort of awareness in the adoption of efficient strategies and materials to guarantee enhanced learning, language proficiency and developed skills.

Ultimately, the study's concluding findings demonstrated that FCM can be an effective teaching approach for English for oil drilling courses in the digital age, but further research was emphasized and preferred. With respect to the level of effectiveness of FCM, a set of strengths appeared after its implementation in the target department. Instances in this case included: Relatively meeting learners' expected language proficiency level, clearly stating learning objectives, ensuring access to educational resources for the majority of the sample members, increasing opportunities allowing for the application of 21st century skills such as critical thinking and problem solving, complying with learner-centeredness principles, employing dynamic assessment methods during the sessions, creating positive educational atmosphere, and providing access to digital educational content for the target students to balance their academic career with personal responsibilities as adult learners who showed self-discipline and responsibility as evidenced by their ability to manage web distractions.

As for the shortcomings identified from the implementation of the designed course, FCM failed to resolve a number of issues among which were: Absence during in-class sessions, low in-class participation, lack of online engagement, overcoming learner passivity, conveying the value of the English course, and improving the status of ESP as a secondary subject.

It seems concluding that adopting FCM in the Department of Mechanics and Drilling of Oil Fields will be improved by overcoming any of the challenges faced during the implementation of the flipped course. These implications suggest areas for its enhancement, notably emphasizing the need for comprehensive training programs focused on adopting modern teaching methods, including specialized training in ESP and EMI, along with fostering digital literacy among instructors. Additionally, it is essential to devote funding to design an official course offered by the department, through involving English language teachers and experts in the oil industry. Furthermore, adopting modern assessment strategies is crucial as innovative methods for enhancing learning. Addressing issues such as ESP session skipping and enhancing the value of the ESP coefficient will also be vital for improving overall educational engagement.

The research draws to a close by introducing a number of recommendations for ensuring better application of FCM in the target department and shedding the light on others areas necessitating further research. Longer period for flipped course implementation, tracking learners' in-person and online presence to ensure their access and engagement to the learning content, offering incentives are some of the recommended procedures to enhance the implementation of the flipped oil drilling course. Pertaining to further research recommendations, replicating this research by addressing its limitations, narrowing its focus or investigating the shift to EMI are instances to be considered.

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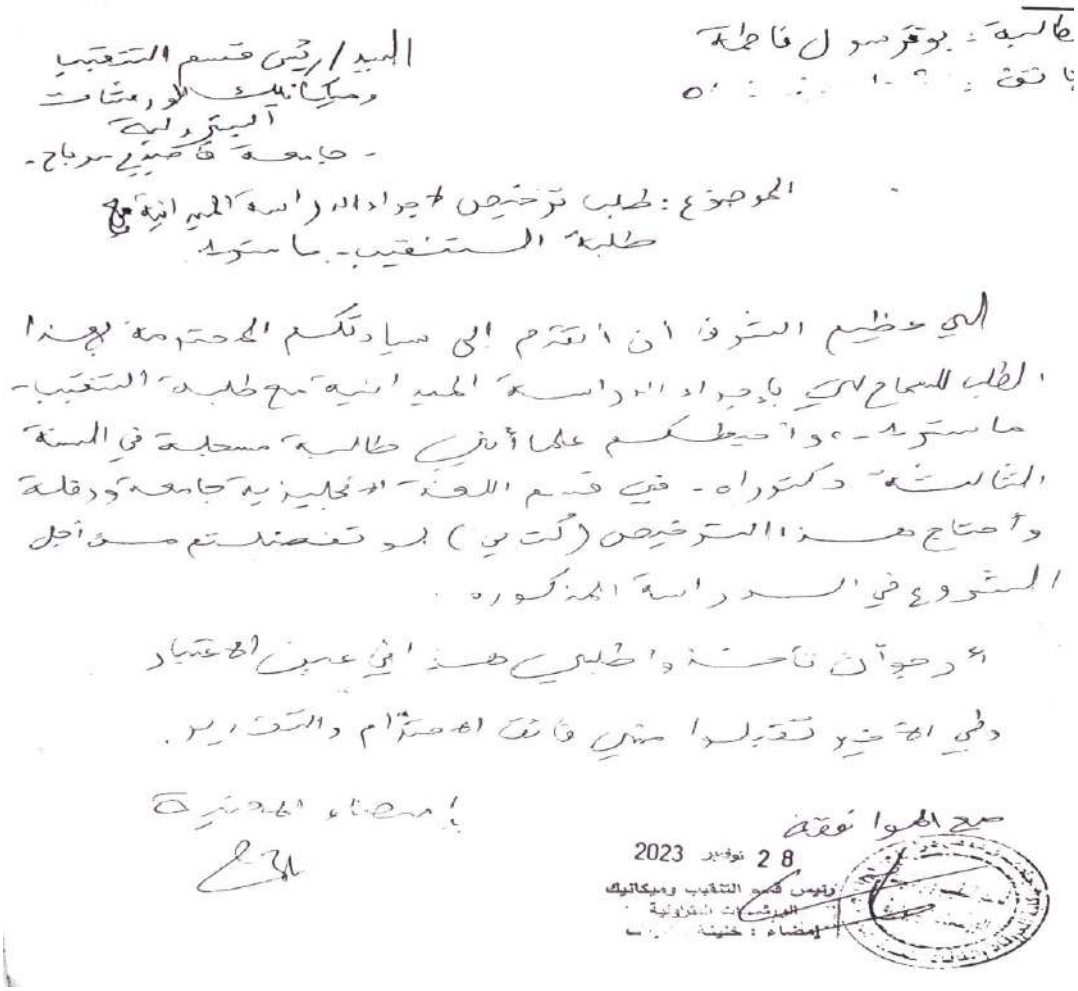
Appendices

Appendix A: Consent for Study Conduct by Head of the Department



Appendix B: Technical Schedule for Mater Mechanics and Oil Drilling Students

Université KASDI Merbah-Ouargla
Faculté des hydrocarbures, des énergies renouvelables et des sciences de la terre et de l'univers
Département de Forage et Mécanique des chantiers pétroliers

Fiche technique année universitaire 2023-2024

	1 ère Année Hydrocarbure + ER	2 ème année M.C.P	2 ème année FORAGE	3 ème année M.C.P	3 ème année FORAGE	1 ère année Master M.C.P	1 ère année Master FORAGE	2 ème année Master M.C.P	2 ème année Master FORAGE
Nombres des étudiants	/	32/	40	/	/	/	/	/	/
Nombre des groupes	8+2	1	1	1	2	1	2	1	3
Salle pour chaque groupe	Amphi D SALLES : 09-10-11-12	Salle 13	Salle 14	Salle 15	Salle 18	Salle 16	Amphi A	Salle 17	Amphi A

Appendix C: Class Timetable for Master 1- Oil Drilling

Université KASDI Merbah-Ouargla
Faculté des hydrocarbures, des énergies renouvelables et des sciences de la terre et de l'univers
Département de Forage et Mécanique des chantiers pétroliers

EMPLOI DU TEMPS

2023/2024 1 ÈRE ANNÉE MASTER FORAGE S1 Amphi A **2023/2024**

	8H – 9H 30	09H40 – 11H 10	11H20 – 12H 50	13H10 – 14H 40	14H 50 -16H 20	16H 30 – 18H
Dimanche	C Petro physique et diagraphie	T.D Analyse numérique G3 12 T.D G1Résistance des matériaux S17	T.D G2 Analyse numérique S12 T.D G3Résistance des matériaux S15		T.D Analyse numérique G1 S12 T.D G2 Résistance des matériaux 16 S17	
Lundi	C Analyse numérique	T.D G1Petrophysique et diagraphie S13	T.D G3 Petro physique et diagraphie S 13		T.D G2 Petro physique et diagraphie S17	
Mardi	C. Forage horizontal, dévie et multilatéral	C Résistance des matériaux	C Communication écrite et orale 18/19		T.D G2Équipement de test S 13	
Mercredi	C. Forage horizontal, dévie et multilatéral	T.D G1 Equipement de test S T.D G2 Forage horizontal, dévie et multilatéral S 12	T.D G3 Forage horizontal, dévie et multilatéral S12		C Equipement de test	T.D G3Equipement de test S 18/19
Jeudi	C Energie enjeux AMPHI A	T.D G1 Forage horizontal, dévie et multilatéral S 12	C Anglais technique Amphi A			

Appendix D: Pre-Intervention ESP Teacher Interview

Questions:

1) What age category do you belong to? (20- 25; 25-35; 35+)

2) Are you an engineering ESP teacher or an EFL teacher?

3) Are you an in-service or a temporary teacher?

4) How long have you been teaching ESP?

5) What suits you better? Teaching the whole batch of students in the same room, organizing them into in groups or teaching online?Why?

6) Are your students studying General English or English for Specific Purposes?

7) Does the content of English have relation with the other subject matters of students' specialty?

8) How often do you resort to the native language to clarify new items or ideas?

9) How do you evaluate the level of students' readiness and motivation to study English? (Highly motivated – moderately motivated - not interested at all)

10) Did your students use to prepare some information for English sessions?

11) What instructional materials do you use in the class? (Visual aids, audios, texts, pictures, etc)

12) Are you using technology in teaching English? In case of 'yes', what types of technology do you use in your classes, and how do you integrate them to accomplish lessons' objectives?

13) Do you depend on Internet in your lessons?

14) What are the types of activities and exercises that better motivate your students?

15) Do your class tasks provide any opportunities for communication in English?

16) Did you use to provide your students with homeworks or outside class projects?

17) Did you use new online education modalities such as blended learning and flipped classroom model before Covid-19 pandemic spread?

18) Which of the following best describes your teaching practices during Covid-19 pandemic spread? Zoom conferencing and online discussion with students; uploading video and document lectures on digital platforms; In-person short sessions with lecture handouts; Sending courses into students' emails

19) Which of the following techniques do you use to assess students' progress? Tests and exams, comprehension checks, writing tasks, gap fill exercises, oral presentations

20) How can you evaluate your technological skills?

21) What are the problems facing your students with English language?

22) What are the common difficulties that your students face when learning English?

Appendix E: Learner Needs Analysis Questionnaire

Dear Students,

This questionnaire is meant to identify your needs as far as your English course content and modern approaches to teaching are concerned. All data will only be used for academic purposes with anonymity.

So, you are kindly invited to answer this questionnaire.

Thank you for your contribution and help**.**

* Indicates required question

I accept that my answer to this questionnaire will be used for the current research. *

- Yes

Section 1: Demographic information

Age *

- 20- 25
- 25-35
- 35+

Gender*

- Male
- Female

Section 2: Learners' Experience and attitudes towards learning English

In which level would you classify your English proficiency? *

- Beginner
- Intermediate
- Advanced

What do you use English for? *

- Reading articles and books related to your major
- Writing letters and e-mails to chat with people around the world
- Watching movies without reading subtitles
- Note taking in class
- Other…

What are your main goals out of learning English? *

You need it in your future career

It is necessary for your studies

It is very important in today’s interactions and science as an international language

Other...

To what extent do you need English in your studies? *

- A great deal
- A sufficient amount to deal with the course
- None at all
- Already have a satisfactory level

You best learn English through*

- chatting online with English otheand different nationalities
- English grammar exercises
- Videos and songs in English
- None of these
- Other…

What is your attitude towards studying English? *

- enjoying learning it
- resenting the time you spend learning it
- neutral

How can you describe your English learning experience before Master's enrollment? *

- Excellent
- Good
- Bad

Why? *

.....

Section 3: Learners' Difficulties Related to the 4 Skills

What are the problems you face when you listen to English extracts?*

- No vocabulary understanding

- Impossibility of catching the meaning immediately
- No distinction between the sounds of each word
- Inability to get the main idea
- Other…

What are the problems you face when you speak English? *

- Lack of adequate vocabulary
- Making grammar mistakes
- Fear of words mispronunciation
- Feeling embarrassed to speak in English in front of the class
- Need to think in Arabic first then translating into English
- Other...

What are the problems you encounter when you read English passages? *

- No comprehension of the meaning
- Translating into Arabic first to understand the text
- Lack of vocabulary causing misunderstanding
- Other...

What are the problems you encouter when you write in English? *

- lack of English vocabulary
- need to think in the native language first
- inability to write grammatically correct sentences
- Other…

Improving your English level is related to *

- Your efforts, motivation, interest and engagement
- Teacher’s great efforts and well-prepared lessons
- The use of appropriate educational materials

- None of these
- Other…

Section 4: Learners' Description of a Good Lesson Criteria

How do you describe your best English course?

Tick one answer in each row* 1 Strongly disagree, 2, 3, 4, 5 Strongly agree

- In this course, I have the opportunity to express my ideas.
- the course objectives are clear since the beginning. of the course.
- This course enables me to evaluate others' performances
- In this course, I have the opportunity to collaborate with peers to perform tasks
- In this course, I use online language learning tools
- In this course, I can work independently
- The interaction with my teacher helps me develop my linguistic abilities
- the interaction with my peers helps me develop my communication skills
- the teacher dominates the course and the student is just a receiver
- the teacher is guiding me through my learning process and I am just recieving the information
- The teacher uses learning videos in class
- online learning materials help me develop my learning process
- The in-class activities are communicative
- The students are the major participants in class
- Students make oral presentations in English
- There are activities that encourage me to creativeperformances (like projects/ videos/ role plays ..)
- In this course, I have the opportunity to express my ideas.
- the course objectives are clear since the beginning. of the course.
- This course enables me to evaluate others' performances
- In this course, I have the opportunity to collaborate with peers to perform tasks

- In this course, I use online language learning tools
- In this course, I can work independently
- The interaction with my teacher helps me develop my linguistic abilities
- the interaction with my peers helps me develop my communication skills
- the teacher dominates the course and the student is just a receiver
- the teacher is guiding me through my learning process and I am just recieving the information
- The teacher uses learning videos in class
- online learning materials help me develop my learning process
- The in-class activities are communicative
- The students are the major participants in class
- Students make oral presentations in English
- There are activities that encourage me to creative performances (like projects/ videos/ role plays ..)

Section 5: Learners' Preferences Related to the Types of Classroom Activities

How important are the following skills so that they should be integrated in your English class?

Tick one answer in each row* 1 extremely unimportant, 2, 3, 4, 5 extremely important

- Summarizing and recapitulating an oral, written or audio text(a conversation/ a speech / a video)
- Following TV or other programs based on interviews
- Taking part in discussions in your field of study
- Making oral presentations related to your major
- Deducing the main ideas from major-related texts and articles
- Taking notes in lectures
- Rewriting a text using your own words in English
- Writing reports related to oil drilling in English
- Finding particular information and details in a hydrocarbons text

- Linking ideas with arguments
- Comparing information
- Summarizing and recapitulating an oral, written or audio text(a conversation/ a speech / a video)
- Following interviewing sessions
- Taking part in discussions in your field of study
- Making oral presentations related to your major
- Deducing the main ideas from major-related texts and articles
- Taking notes in lectures
- Rewriting a text using your own words in English
- Writing reports related to oil drilling in English
- Finding particular information and details in a hydrocarbons text
- Linking ideas with arguments
- Comparing information

Section 6: Learners' Experiences with Online Education

When have you had experience with online education in learning English? *

- only at university during Covid-19 lockdown
- Always in your studies
- never

Which problems have you faced while studying online? *

- Downloading errors, installation problems, login issues
- Availability and access to the Internet
- Lack of technology manipulation skills
- No technological devices such as laptops or smartphones
- None of these options

- Other...

Appendix F: Original Syllabus for Technical English in Drilling

Intitulé du Master : Forage

Unité d'Enseignement (UET) : Culture Générale

Semestre *:* S1

Matière 1 : Anglais technique

Enseignant responsable de l'UE : ….

Enseignant responsable de la matière:

Objectifs de l'enseignement :

Acquérir des connaissances de l'étudiant sur l'anglais technique utilisé dans le domaine de forage, qui lui permet la compréhension des textes et l'utilisation des manuels et des procédures rédigés en anglais, au sein de l'entreprise.

Connaissances préalables recommandées :

Compétences acquises durant sa formation en licence**.**

Contenu de la matière :

Chapitre I : Traitement des textes scientifiques

I.1-Refinery

I.2- The organization

I.3- Procedures: Rules and regulations

I.4- Decontamination Procedures

Chapitre II : Traduction des textes scientifiques

II.1- Processes: Exploration

II.2- Distillation

II.3- Refining

II.4- Equipments: the blowout preventer

II.5-The circulation system

II.6-Pipeline components

Mode d'évaluation :

évaluation écrite (examens) et évaluation continue (exposés, interrogation…)

Appendix G: Pre-Session Activities Samples

Lesson 1:

Learning objectives

-Understand the purpose, functions, and processes involved in oil refining.

-Determine the various refined petroleum products manufactured in a refinery.

Pre-class phase:

Task 1: Watch the video on this link: https://youtu.be/vD0kbdIS6kE?t=2

Choose the right option in each question:

1) which title best suits the content of this video ?

a- crude oil

b- types of oil products

c- different processes in a refinery

2) The first process in a refinery mentioned in the video is

a- Cracking

b- Reforming

c- Distilling

3) which of these best reflects the order of the processes in a refinery as presented in the video?

a- treating- distilling- cracking- reforming- blending

b- distilling- cracking- reforming- blending- treating

c- distilling- reforming- cracking- blending- treating

Task 2 : Select true or false

3) Cracking maximizes the usefulness of heavy oil

True

False

2) Distilling increases the amount of gasoline produced from crude oil

True

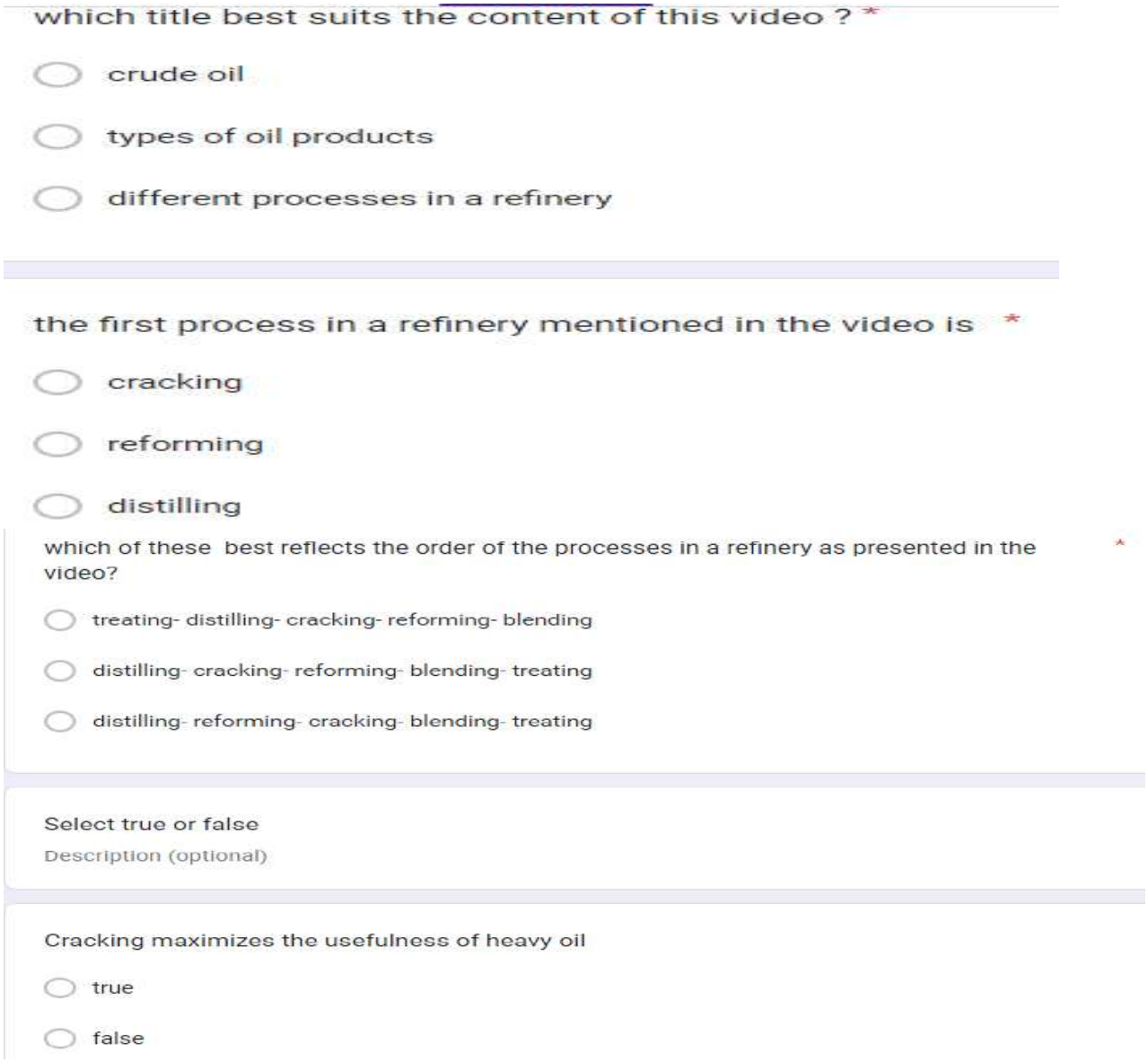
False

3) Treating contributes at protecting our environment and our health

True

False

Appendix H: Sample Pictures from Google Forms Pre-Session Activities



Appendix I: Delivered in-Class Flipped Lessons Samples

Lesson 1

Learning objectives

-Determine the various refined petroleum products manufactured in a refinery.

Text: Oil Products

Crude oil is a mixture of hundreds of different compounds and is practically useless when taken from the ground. It has to be refined to turn it into useable products. Three types of motor fuel are produced in oil refineries – petrol, diesel and LPG (Liquefied Petroleum Gas). Petrol and diesel

are much more widely used than LPG although LPG is more versatile – it can be used in domestic heating systems and for camping gas. LPG also produces fewer emissions than either petrol or diesel fuels but it is not as popular. Fuel oil also comes from crude oil and is a heavy fuel used for ships and factories.

Most cars have petrol engines and larger vehicles (i.e. buses) tend to have diesel engines. Diesel engines operate at much higher pressures than petrol engines and therefore they have to be built more strongly. However, diesel engines are more efficient than petrol engines and are more economical – they can use up to 40% less fuel.

In addition to motor fuels important products refined from oil are lubricants. Lubricants are essential to ensure moving parts in a machine work smoothly and stop them overheating. Different lubricants are suitable for different jobs. Engine oil is less viscous than grease and is used to lubricate all the moving parts of an engine. Grease is much thicker and is used to protect sealed bearings. Multigrade lubricants can operate at different temperatures without being affected. Lubricants without a temperature sensitive polymer are more viscous at low temperatures than at high temperatures.

Task 1: Read the text and complete the table.

Oil Product	Uses	Properties
Petrol/ Gasoline	.....	.....
Diesel	.....	.....
LPG	.....	.....
Fuel oil	.....	.....
Engine oil	.....	.....
Grease	.....	.....
Multigrade lubricants	.....	.....

Task 2: Read the definitions then correctly identify the corresponding technical terms from the text

1) ……. refers to a flammable hydrocarbon gas that is derived from the refining of crude oil. It consists of propane and butane and is commonly used as a fuel source for domestic heating systems, camping gas, and certain vehicles.

2) …….. is a heavy, viscous fuel derived from crude oil. It is commonly used in industrial settings, such as ships and factories, as a source of energy. Due to its high energy content, it is suitable for applications that require sustained heat generation.

3)……..… are substances used to reduce friction and wear between moving parts in machinery or engines. They prevent overheating and ensure smooth operation by forming a protective layer between surfaces. Engine oil and grease are examples of lubricants used in different applications based on their viscosity and specific properties.

Task 3: Find in the text synonyms for the following words/phrases:

a) operational, practical = ……..

b) fuel-efficient = ……..

c) thick = ……..

d) long-lasting heat production = ……..

e) excessive heating = ……..

Task 4: In groups,write a short paragraph Discuss the advantages and disadvantages of petrol and diesel engines. Which type of engine do you think is more suitable for everyday use? Why?

……

Lesson 2: The Organization

Learning objectives

- Describe the structure and organization of companies operating in the oil industry.
- Identify the roles and responsibilities of different departments or divisions within an oil company.
- Understand the decision-making processes and the importance of effective management in the oil industry.

Pre-class phase:

Task: Watch the video on this link: https://youtu.be/9mMU8Ojamm8

Answer the following questions:

1- What is the video about?

2- Which of these jobs in oil and gas production are mentioned in the video?

Subsea engineer	Construction manager	Petroluem chemist
Inspectors	Safety officer	Rig welder
Piping designer	Sales representative	Land agent

3- What is the salary range for a subsea engineer?

4- What are the educational qualifications of subsea engineer?

5- What are the job titles that can be associated with the coming described responsibilities or duties?

a) Overseeing the construction project, managing coordination and construction activities to ensure the successful completion and delivery of the projects within the specified timeframe and budget: .....

b) Marketing oil and gas services ……

c) Identifying available land sites for sale and negotiating the purchase desirable land properties .....

During class:

Text: A world of Opportunities

There are many different jobs within the oil and gas industry, each requiring different skills and qualifications and sometimes travel. Working as a labourer is physically hard. You have to be strong and willing to work very hard. You work outdoors onsite, perhaps for a drilling or a pipeline company. You only need qualifications from school and, of course, health and safety qualifications. You get the chance to travel and often get paid overtime so you can earn good wages.

An apprentice begins work after leaving school. Working together with a qualified person such as a technician, electrician or welder to learn the job. At the same time, an apprentice spends time at college to get a recognized certificate or diploma. It can take three or four years but there is

the chance to travel and get paid for overtime too. Technologists usually study at college for two or three years and have a qualification before they begin work in specialized fields. Their job is to decide which equipment to use on site, know how to install it, and use it. Some technologists have an office job, but some work in the field and have to travel.

Engineers have a university degree and are often expected to do more study while working. They earn a good salary, but they have a lot of responsibility and have to know and follow regulations. There are usually good chances of promotion and many engineers work their way up to jobs as managers. Engineers work in the office and also travel to work sites.

Of course, not all the jobs in oil and gas are technical jobs. There are many people who work in transportation, health and safety, or customer relations. There are also people who have to negotiate with land owners and draw up contracts. It's an amazing industry! There are millions of people working in almost every country in the world so there are lots of opportunities.

Task 1: Read the text and answer the questions:

1. What are the jobs mentioned in the text?

.....

2. What are the qualifications needed by

- a labourer? .....
- an apprentice, ...
- an engineer? .....

3. Are all the jobs in the oil and gas industry technical?

.....

4. Are there enough job opportunities in oil and gas companies?

.....

Task 2: Read the text and put a tick (✓) for yes and a cross (X) for no in the boxes in the table:

	Office job	College education	University education	Opportunity to travel	overtime
A labourer					
An apprentice					
technologist			/		/
engineer		/			/

Task 3: Complete the following sentences with one of the following words:

"overtime- wages- certificate- office job- degree- salary- promotion"

1) I've been working as a technologist, but now I've finished my course at university and I hope to get .....soon.
2) We have to work 38 hours a week, but if we work longer we get paid.....
3) Workers usually get paid ....., but professional people get paid a .....
4) He doesn't work outside. He's got an .....
5) You must do a health and safety course and get a .....before you can work in this area.
6) It takes three or four years of university to get a .....

Task 4: Match the pictures to the jobs with the photos:

1- land surveyor .....

2- maintenance technician .....

3- petroleum chemist .....

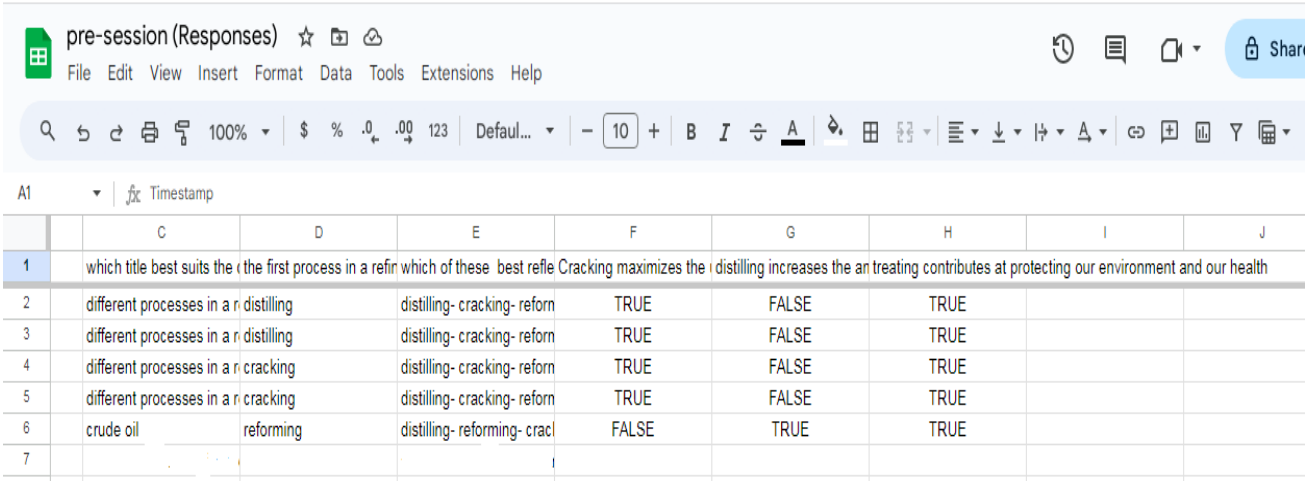
4- piping designer .....

5- refinery manager .....

6-safety officer.

Task 4: Write interview questions and prepare responses that highlight your relevant skills, qualifications, and experiences.

Appendix J: Screenshots of Pre-Session Learners' Answers

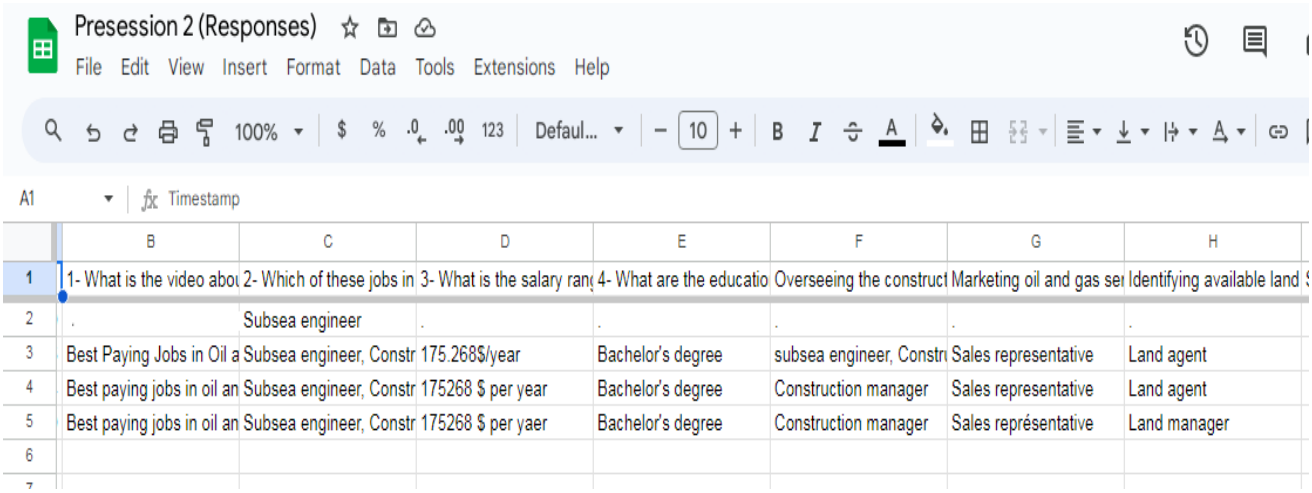


pre-session (Responses)

File Edit View Insert Format Data Tools Extensions Help

A1 Timestamp

	C	D	E	F	G	H
1	which title best suits the (	the first process in a refir	which of these best refle	Cracking maximizes the (	distilling increases the an	treating contributes at protecting our environment and our health
2	different processes in a r	distilling	distilling- cracking- reforn	TRUE	FALSE	TRUE
3	different processes in a r	distilling	distilling- cracking- reforn	TRUE	FALSE	TRUE
4	different processes in a r	cracking	distilling- cracking- reforn	TRUE	FALSE	TRUE
5	different processes in a r	cracking	distilling- cracking- reforn	TRUE	FALSE	TRUE
6	crude oil	reforming	distilling- reforming- cracl	FALSE	TRUE	TRUE
7						



Presession 2 (Responses)

File Edit View Insert Format Data Tools Extensions Help

A1 Timestamp

	B	C	D	E	F	G	H
1	1- What is the video abou	2- Which of these jobs in	3- What is the salary ran(	4- What are the educatio	Overseeing the construct	Marketing oil and gas ser	Identifying available land
2	.	Subsea engineer	.	.	.	.	.
3	Best Paying Jobs in Oil a	Subsea engineer, Constr	175.268$/year	Bachelor's degree	subsea engineer, Constr	Sales representative	Land agent
4	Best paying jobs in oil an	Subsea engineer, Constr	175268 $ per year	Bachelor's degree	Construction manager	Sales representative	Land agent
5	Best paying jobs in oil an	Subsea engineer, Constr	175268 $ per yaer	Bachelor's degree	Construction manager	Sales représentative	Land manager
6							

Appendix K: Classroom Observation Checkilist

Class: Master 1- Oil Drilling
Date: .....
Time: .....

Department: Drilling & Mechanics of Oil Fields
University: Kasdi Merbah- Ouargla.

Classroom Observation Checklist

Mark "0" for not observed, "1" somewhat or sometimes observed, or "2" for "often or very observed

Criteria	Items	0	1	2
Warm up Components	Quiz about the pre-class phase			
	Review of the previous lesson			
	Summary of the pre-class covered content			
	Directly starting the lesson			
Teacher-students interaction during in-class phase	invite classroom discussion			
	use a lesson plan			
	be aware about passive learners			
	extend discussion			
	guide students to perform tasks			
	support peer-to-peer question-answer			
General classroom practices	Employing digital tools			
	Clear directions to Sts			
	Providing enrichment and remediation where required			
	Considering time constraints			
	Keeping adequate lesson pace			
	Maintaining interest and attention			
	Devoting more time to discussion			
	Making learning more active			
	Giving more control to students and changing teachers' role into facilitator			
Learning Activities	Tasks are related to oil drilling specialty			
	Highly suitable to learners' level			
	Involving			
	Use logical and thought-provoking questions			
	Based on learners' previous experiences and background			
	Related to learners' needs			
Students' Performance matched to the 21st Century Skills	1- Collaboration :			
	Work together in a team			
	Learn cooperatively with others			
	Value the opinion of others			
	Positive reaction to teacher's feedback			
	Respond to teacher's directions and instructions			

	2- Communication			
		Speak mixing English with Arabic or French with emphasis on fluency and clear ideas		
		Speak with emphasis on accuracy and right pronunciation		
		Read with understanding		
		Clearly convey their oral message so others understand		
		Listen actively, respond and take notes		
		Passively listen to the teacher		
		Listen critically and ask questions		
		Interpret graphically presented data and ideas		
		Highly depend on teacher's explanation of tasks		
		Feel confident when answering questions and participating in discussions		
		Feel excited when communicating in English		
	3- Critical thinking			
		Classify		
		Plan		
		Rank		
		sequence		
		Compare		
	4- Creativity and innovation			
		Express new ideas		
		Create original and innovative work or content		
	5- Problem-solving skills			
		Identify the existing problem		
		Summarize and take notes		
		Make decisions		
		Determine any type of relationships (e.g. cause-effect)		
Students' Production Types	Read technical manuals in English			
	Read journals in the fields of oil drilling			
	Write and read a wide variety of emails, faxes, letters and other professional communications			

	Write CVs			
	Write formal reports			
	Receive foreign visitors and engaging in both formal and informal communication			
	Make telephone conversations of both a technical and a commercial nature			
	Attend meetings			
	Negotiate new business or contracts for the company			
	Give formal presentations and respond to questions			
	Attend international conferences			
Effectiveness of the lesson	Give opportunity to students to reflect on their learning (motivation,			
	suitability of time frame, materials, activities			
	Clear objectives			
	Suitable learning activities			
	Suitable materials for the course			

Appendix L: Student Post Study Questionnaire

Dear Students,

The purpose of this questionnaire is to collect data about your attitudes towards the content of the English language course and the teaching method used. All data will be used for academic purposes only, with anonymity preserved. I kindly request you to respond to this questionnaire. Thank you for your contribution and assistance.

- **I agree to participate in this study**

Section 1: Gender:

Male

Female

Section 2: Online Learning Experience and Engagement

Please rate the following statements based on your experience in the online English course:

1) The video lectures and materials greatly contributed to my understanding of the course content.

- Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

2) In-class activities and discussions enhanced practical application of pre-session learning materials.

- Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

3) Online access to course materials offered the freedom to learn at one's preferred pace and review content as needed.

- Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

4) Online learning deepened my comprehension and ability to remember the course content compared to traditional teaching methods

- Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

5) Online learning approach reduces the feeling of boredom and pressure of studies

- Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

Section 3: Effectiveness of Online Learning

6) How effective was the online teaching approach in improving your engagement and participation in the English course?

- Very Ineffective | Ineffective | Neutral | Effective | Very Effective

7) Were you able to apply the knowledge and skills learned in the online sessions to real-life situations in your field?

Yes, it helped significantly / Yes, to some extent / No, there was no relation between what we study and real life situations / Not applicable – I did not experience distance learning

8) Did you have sufficient opportunities for interaction, questions and feedback during the online sessions?

A)Yes, plenty of opportunities.

B) Yes, some opportunities.

C) No, limited opportunities.

D) Not sure, I didn't seek clarification/feedback.

E) Not applicable – I didn't participate in online sessions

Section 4: Challenges in Online Learning

9) What challenges did you face while learning English online?

A) Slow or unreliable internet connection.

B) Difficulty accessing online learning platforms or using software or tools, such as unfamiliarity with Google Meet features, activating the camera and microphone, etc

C) Technical issues disrupting the online learning experience (e.g., audio/video problems, screen freezing)

D) Compatibility or installation issues with required software or tools.

E) Limited access to necessary hardware (e.g., computer, microphone, webcam).

F) Difficulty navigating or understanding the online learning interface.

G) Distractions from social media (e.g., Facebook, Telegram) and other online activities unrelated to the online session of English

H) Other (please specify): .....

10) As a student, which of the following reasons could contribute to your lack of presence in face-to-face English sessions? Please select all applicable options:

Conflicting schedules or other commitments.

Lack of interest or motivation in the ESP subject matter.

Difficulty in understanding the relevance or applicability of the ESP content.

Personal or health-related issues affecting attendance.

Inadequate communication or promotion of the importance of face-to-face sessions.

Limited engagement or interaction opportunities during the sessions.

Insufficient clarity or understanding of the expectations for participation.

Transportation or logistical challenges for attending the sessions.

Lack of awareness or communication about the benefits of face-to-face interactions.

Other (please specify).

11) What factors contribute to your lack of participation in online English activities?

A) Limited English proficiency

B) Shyness or introversion

C) Technical difficulties and difficulty accessing the online content

D) Lack of interest in the session of English

E) Fear of criticism

F) Cultural barriers

G) Lack of time availability

H) Lack of access to required resources

I) Limited internet connectivity

J) Time constraints

K) Unclear instructions or expectations

L) Too much work and excessive activities

M) Personal distractions or responsibilities

N) other

Section 5: Motivation and Engagement with Pre-Class Assignments

12) Were you motivated to prepare adequately at home before each English in-class session?

A) Very effectively - I consistently allocated sufficient time and came well-prepared.

B) Moderately effectively - I usually allocated enough time and came adequately prepared.

C) Ineffectively - I struggled to allocate enough time and often came unprepared.

D) Insufficient access - I did not have adequate access to pre-class assignments

13) Did you complete the pre-class assignments?

A) Yes, I completed all of them.

B) Yes, I completed most of them.

C) Yes, I completed some of them.

D) No, I didn't complete any of them.

E) Not applicable – I didn't participate at all

14) In times you did not complete the online assignments, what was the reason?

The Internet was not available

You did not possess any technological device such as a computer or a Smartphone

You were bored as the assignments were a busy work and had no value

You did not understand the assignments' instruction

You had no interest in English session

15)) Did you find it challenging to take responsibility for your own learning and engage with pre-class online activities without any help?

A) Yes, I found it challenging.

B) Sometimes, I found it challenging.

C) No, I did not find it challenging.

D) Not applicable - No pre-recorded materials were available for me to engage with outside of class.

Section 6: In-Class Participation and Time Management

16) **Did you feel comfortable participating in the in-class activities and discussions during the English session?**

Did you feel comfortable participating in the in-class activities and discussions during the session of English ?

A) Yes, I felt comfortable participating because the classroom environment was inclusive and welcoming..

B) Sometimes, I felt comfortable.

C) No, I did not feel comfortable because I found the atmosphere to be intimidating or unwelcoming.

D) Not applicable. I was absent during the in-class English sessions.

17) **Was the available in-class time sufficient to adequately cover the necessary content and help you become proficient in English?**

Did you feel that the available in-class time was sufficient to adequately cover the necessary content and help you become proficient in English?

A) Yes, the in-class time adequately covered the necessary content for proficiency.

B) Somewhat, the in-class time partially covered the necessary content for proficiency.

C) No, the in-class time did not sufficiently cover the necessary content for proficiency.

D) Uncertain- I am not interested in being proficient in English

Section 7: Instructor Support and Guidance

18) **Did the instructor provide appropriate support and guidance during the online sessions?**

A) Instructor provided valuable support and guidance.

B) Instructor's assistance was moderately suitable.

C) Instructor's support fell short of expectations.

D) Uncertain/I did not attend English sessions

Section 8: Skills Development and Application

19) What specific aspects of distance learning approach did you find most beneficial?

Deeper understanding of the subject matter

Enhanced critical thinking and problem-solving skills

Increased student engagement and participation

Personalized learning experiences

Development of communication and teamwork skills

Neutral

Not applicable. As I did not attend English sessions

20) In distance learning, were you able to actively participate and collaborate with fellow students to enhance your learning experience?

A) Yes, ample opportunities were provided.

B) Partially, some opportunities were available.

C) No, opportunities were insufficient.

D) Neutral

21) Were you able to apply the acquired skills in practical situations related to your field of study such as communicating in English with experts in hydrocarbons?

A) Yes, I was able to apply the acquired skills effectively.

B) I was able to apply some of the acquired skills, but not consistently.

C) I had limited opportunities to apply the acquired skills.

D) No, I was unable to apply the acquired skills in practical situations.

E) Not applicable / Not relevant to my field of study.

Section 9: Overall Satisfaction towards Course Relevance and Satisfaction

22) Among the following elements, which one is the most prominent in the course described?

a. Industry-specific vocabulary and terminology.

b. Interactive and communicative activities.

c. Authentic materials for real-world language exposure.

d. Online resources and applications for oil drilling-related content.

e. Collaboration with industry experts for language and communication workshops.

f. Practical language tasks mirroring oil drilling language demands.

g. Regular assessment and feedback for continuous improvement.

h. All of them

i. Other .....

23) Are you satisfied with the content and topics covered in the English session?

Very satisfied / Somewhat satisfied / Neutral/Undecided / Somewhat dissatisfied / Very dissatisfied

24) Did you find the course content relevant and applicable to your field of study?

Yes / No/ Neutral

25) How ready and willing are you to transition from traditional teaching methods to digital approaches?

A) Fully prepared and eager to transition.

B) Mostly prepared and willing to explore digital approaches.

C) Neutral/Undecided about transitioning to digital approaches.

D) Somewhat hesitant but open to trying digital approaches.

E) Not ready or unwilling to transition to digital approaches.

26) How would you rate your overall experience with online learning approach in your English course?

a- Very satisfied

b- Satisfied

c- Neutral

d- Dissatisfied

e- Very dissatisfied

27) Which teaching approach do you prefer?

A) Traditional classroom instruction.

B) Remote learning approach.

C) Blending both

D) No preference

28) Do you recommend the use of the remote learning approach in teaching English in the oil drilling specialty in the future?

a- Yes, strongly recommend.

b- Yes, recommend.

c- Neutral.

d- No, do not recommend.

e- No, strongly do not recommend.

29) Would increasing the coefficient of English change your attitude and level of motivation towards learning English?

A) Yes, it would greatly increase my motivation and attitude towards learning English. I would recognize the increased importance and prioritize my efforts accordingly.

B) It would somewhat improve my motivation and attitude. However, there are other factors that also play a role in my motivation and attitude towards learning English.

C) neutral. I can't decide about its impact.

D) It would have limited impact on my motivation and attitude.

E) No, it would not change my motivation and attitude.

30) In your experience with learning English, what strategies or approaches do you believe can be employed to enhance interest and engagement during an English session?.....

Appendix M: Student Post-Study Questionnaire: Arabic Version

أعزائي الطلبة،

يهدف هذا الاستبيان إلى تقييم مواقفك تجاه محتوى دورة اللغة الإنجليزية والأساليب الحديثة لتدريسها. سيتم استخدام جميع البيانات فقط للأغراض الأكاديمية مع إخفاء الهوية. أرجو منكم أن تجيبوا على هذا الاستبيان. وشكرا لكم على مساهمتكم ومساعدتك

أقبل أن تستخدم إجابتي على هذا الاستبيان في البحث الحالي

* :يرجى تقييم العبارات التالية استنادًا إلى تجربتك في دروس اللغة الإنجليزية عن بُعد

	أوافق تمامًا	أوافق	محايد	لا أوافق	لا أوافق تمامًا
الفيديوات والتمارين ساهمت بشكل كبير في فهمي لمحتوى الدورة	○	○	○	○	○
لأنشطة والمناقشات في الصف ساهمت في تعزيز التطبيق العملي للمواد التعليمية قبل الجلسة	○	○	○	○	○
الوصول إلى محتوى الدروس قدم حرية التعلم بالسرعة المفضلة ومراجعة المحتوى حسب الحاجة.	○	○	○	○	○
التعلم عن بُعد قد عمق فهمي وقدرتي على تذكر محتوى الدروس مقارنةً بأساليب التدريس التقليدية	○	○	○	○	○

التعلم عن بُعد يقلل من الشعور بالملل والضغط الناجم عن الدراسة	○	○	○	○	○
كانت لديك فرص كافية للتفاعل وطرح الأسئلة والحصول على توجيه ومدح الاستاذ خلال دراسة الانجليزية عن بعد	○	○	○	○	○
تمكنت من توظيف المفاهيم والمهارات التي اكتسبتها في الدروس الإلكترونية في مجال تخصصي الجامعي	○	○	○	○	○

* ما مدى فاعلية الأسلوب التعليمي عبر الإنترنت في تحسين مشاركتك في دروس اللغة الإنجليزية؟

- ○ غير فعال تماما
- ○ غير فعال
- ○ محايد
- ○ فعال
- ○ فعال جدًا

* ماهي العراقيل والمشاكل التي واجهتها أثناء حضور حصص اللغة الإنجليزية عن بعد؟
يرجى تحديد جميع الخيارات المناسبة

- ☐ اتصال بطيء أو غير مستقر بالإنترنت
- ☐ صعوبة استخدام البرامج أومنصات التعلم عن بعد والأدوات التكنولوجية مثل عدم الاطلاع على ميزات Google Meet، تفعيل الكاميرا والميكروفون، إلخ.
- ☐ مشاكل تقنية (مشاكل انقطاع الصوت والفيديو، تجميد الشاشة)
- ☐ مشاكل التوافق أو التثبيت الجهاز الالكتروني لدي مع البرامج أو التطبيقات المطلوبة من طرف الاستاذ
- ☐ لاامتلك الأجهزة اللازمة للدراسة (مثل الكمبيوتر والميكروفون وكاميرا الويب).
- ☐ انشغال بأنشطة غير متعلقة بحصة اللغة الانجليزية وعدم القدرة على الحفاظ على التركيز بسبب وسائل التواصل الاجتماعي (مثل Facebook وTelegram)
- ☐ أخرى (يرجى تحديدها): .....

* في المرات التي كنت غائبا فيها عن حصة الانجليزية في القسم ما كان السبب ؟ يرجى تحديد جميع الخيارات المناسبة

- [ ] جداول زمنية متعارضة أو التزامات أخرى (عمل مثلا)
- [ ] عدم وجود اهتمام أو دافع لدراسة اللغة الإنجليزية عند طلبة التخصصات العلمية
- [ ] لا أستطيع أن أجد أي علاقة بين محتوى أو قابلية تطبيق محتوى اللغة الإنجليزية مع تخصصي
- [ ] قضايا شخصية أو صحية تؤثر على الحضور
- [ ] توعية غير كافية او عدم التأكيد على أهمية الحصص الحضورية للغة الانجليزية
- [ ] فرص محدودة للمشاركة أو التفاعل خلال الحصص الحضورية للانجليزية
- [ ] تحديات النقل أوصعوبات الوصول الى قاعة الدراسة
- [ ] أخرى (يرجى التحديد): _____

* ما هي عوامل عدم مشاركتك في أنشطة الإنجليزية عن بعد؟
يرجى تحديد جميع الخيارات المناسبة

- [ ] مهارة محدودة في اللغة الإنجليزية
- [ ] مهارات محدودة في استعمال التكنولوجيا كالتطبيقات والايميل
- [ ] لاامتلك الوقت الكافي للمشاركة
- [ ] الخوف من التعرض للانتقادات
- [ ] عدم الاهتمام بحصة اللغة الإنجليزية
- [ ] صعوبات تقنية تمنع الوصول إلى المحتوى عبر الإنترنت مثل مشاكل تثبيت البرامج وتوافقها مع الجهاز الالكتروني
- [ ] الخجل أو الانطوائية
- [ ] اتصال إنترنت محدود
- [ ] عدم الوصول إلى الموارد المطلوبة
- [ ] عدم توفر وقت كافٍ
- [ ] العوائق التقافية المتعلقة باستعمال التكنولوجيا
- [ ] المطلوب والتمارين غير واضحة
- [ ] عمل اضافي غير مهم
- [ ] تشتت شخصي أو مسؤوليات شخصية
- [ ] آخر

* هل كنت تحضر بشكل كافٍ في المنزل قبل الحصص الحضورية للغة الإنجليزية؟

- بشكل فعّال جدًا - كنت دائمًا أخصص وقتًا كافيًا وكنت مستعدًا تمامًا
- بشكل معتدل نسبيا - عادةً ما أخصص وقتًا كافيًا وأكون مستعدًا بشكل مناسب
- بشكل غير فعّال - واجهت صعوبة في تخصيص وقت كافٍ وكنت غالبًا غير مستعد.
- عدم القدرة على الوصول الى المصادر التعليمية والواجبات التحضيرية قبل حصص الانجليزية

* هل أنجزت كل الواجبات والوظائف التحضيرية المرسلة اليك عبر الايمايل قبل الحصص الحضورية للانجليزية؟

- نعم، أنجزتها جميعها
- نعم، أكملت معظمها
- نعم، أكملت بعضها
- لا، لم أكمل أيًا منها رغم اطلاعي عليها
- لم أشارك على الإطلاق

* في المرات التي لم تنجز فيها الواجبات المرسلة اليك عبر الايميل، ما هو السبب؟

- كان الإنترنت غير متاح
- لم يكن لديك أي جهاز تقني مثل الكمبيوتر أو الهاتف الذكي
- كانت المهام والتمارين مملة و مجرد عمل اضافي وليس لها قيمة
- لم تفهم تعليمات او المطلوب من التمارين
- لم يكن لديك اهتمام بدروس اللغة الإنجليزية

* هل وجدت صعوبة في التعلم الذاتي وانجاز التمارين المرسلة الكترونيا قبل حصص الانجليزية بدون أي مساعدة من زميل او استاذ؟

- نعم
- أحيانًا
- لا، لم أجد ذلك صعبًا
- لم اكن مهتما بالتمارين المرسلة في ايمايلي

* هل كانت بيئة الدراسة مشجعة ومساعدة على المشاركة في التمارين والنقاش داخل القسم خلال حصة اللغة الإنجليزية؟

- نعم، كنت مرتاح في المشاركة باستعمال النجليزية لأن بيئة القسم كانت مساعدة على النقاش
- أحيانًا، شعرت بالراحة
- لا، لم أشعر بالراحة لأن بيئة الدراسة كانت غير مشجعة أو غير مرحبة لطرح الافكار او استعمال الانجليزية
- لم أكن حاضرًا خلال حصص اللغة الإنجليزية في القسم

* هل كان الوقت المخصص لحصص الانجليزية كافيًا لتغطية المحتوى الضروري لتخصصك و مساعدتك في اتقانها؟

- نعم، الوقت في القسم كان كافيًا لتغطية المحتوى الضروري لتعلم اللغة الانجليزية واتقانها
- إلى حد ما، الوقت في القسم غطى جزئيًا ذلك المحتوى
- لا، الوقت في القسم غير كاف
- محايد - لست مهتمًا بأن أصبح ماهرًا في اللغة الإنجليزية

* هل قدم الاستاذ الدعم والتوجيه المناسب خلال حصص الانجليزية عن بعد؟

- نعم
- إلى حد ما
- لا. لم يكن دعم الاستاذ يلبي التوقعات
- غير متأكد.لم أحضر حصص اللغة الإنجليزية

* ما هي الجوانب التي حسنها التعليم عن بُعد في حصص الانجليزية؟ يرجى تحديد جميع الخيارات المناسبة

- [ ] فهم أعمق للموضوع
- [ ] تعزيز مهارات التفكير النقدي ومهارات حل المشكلات
- [ ] زيادة التشارك بين الطلاب في انجاز التمارين والواجبات
- [ ] تتيح للطالب اختيار بين الموارد والانشطة التي تناسب احتياجاته ومهاراته وتطوره في اللغة
- [ ] تطوير مهارات التواصل والعمل الجماعي بين الطلبة
- [ ] محايد

* خلال التعلم عن بُعد، هل كانت هناك فرص كافية للمشاركة والتعاون مع زملائك في انجاز التمارين؟

- نعم، توفرت فرص كافية
- جزئيًا، توفرت بعض الفرص
- لا، لم تكن الفرص كافية
- محايد

* هل تمكنت من تطبيق المهارات المكتسبة من حصص الانجليزية المتعلقة بمجال دراستك في الواقع، مثل التواصل باللغة الإنجليزية مع خبراء في المحروقات؟

- نعم، تمكنت من تطبيق المهارات المكتسبة بفعالية
- نعم، ولكن ليس بشكل كاف
- كانت لدي فرص محدودة لتطبيق المهارات المكتسبة
- لا، لم أتمكن من تطبيق المهارات المكتسبة في الواقع
- لم احاول اصلا

* من بين العناصر التالية، أي عنصر هو الأكثر بروزًا خلال حصص الانجليزية -الحضورية وعن بعد-؟

- ◯ المفردات والمصطلحات الخاصة بمجال المحروقات
- ◯ الأنشطة التفاعلية والتواصلية(interactive and communicative activities)
- ◯ مواقف لغوية تطبيقية تعكس استعمالات اللغة الانجليزية في الواقع (حوارات مثلا)
- ◯ تمارين ومحتوى (مرئي او مكتوب) عبر الإنترنت متعلق بمجال المحروقات
- ◯ التعاون مع خبراء في مجال المحروقات لتوفير فرص لاستعمال اللغة الانجليزية والتواصل مع الناطقين بها
- ◯ التقييم الدوري (واجبات ووظائف منزلية) وتقديم الملاحظات الايجابية والتوجيهات المستمرة من طرف الاستاذ لتحسين الاداء اللغوي للطلبة
- ◯ جميعها
- ◯ Other: _____

آخر (يرجى التحديد)

.....

* يرجى الاجابة على الاسئلة التالية لتقييم تجربتك مع دروس اللغة الانجليزية

	غير راضٍ جدًا	غير راضٍ إلى حد ما	محايد	راضٍ إلى حد ما	راضٍ جدًا
كيف تقيم محتوى دروس اللغة الإنجليزية (حضورية او عن بعد) وهدفه لتعزيز اتقان الطلبة للغة الانجليزية؟	◯	◯	◯	◯	◯
كيف تقيم تجربتك العامة مع نهج التعلم عن بعد لحصص الإنجليزية؟	◯	◯	◯	◯	◯

* مامدى استعدادك للانتقال من الأساليب التقليدية لتدريس الانجليزية إلى الأساليب الرقمية الحديثة؟

- ◯ أنا مستعد تمامًا ومتشوق للاعتماد على اساليب التعليم الحديثة لتسهيل تعلم الانجليزية
- ◯ أنا مستعد الى حد ما
- ◯ أنا محايد
- ◯ أنا غير متاكد من فاعليتها
- ◯ أنا افضل الطرق التعليمية التقليدية على الطرق الرقمية العصرية

* مامدى استعدادك للانتقال من الأساليب التقليدية لتدريس الانجليزية إلى الأساليب الرقمية الحديثة؟

- أنا مستعد تمامًا ومتشوق للاعتماد على اساليب التعليم الحديثة لتسهيل تعلم الانجليزية
- أنا مستعد الى حد ما
- أنا محايد
- أنا غير متاكد من فاعليتها
- أنا افضل الطرق التعليمية التقليدية على الطرق الرقمية العصرية

* أي نهج تعليمي تفضل؟

- التدريس التقليدي حضوريا في القسم
- نهج التعلم عن بُعد
- الجمع بين الاثنين -حضوري وعن بعد-
- محايد

* هل تتصح باستخدام نهج التعلم عن بُعد في تدريس اللغة الإنجليزية في تخصص المحروقات في المستقبل؟

- نعم، أنصح بشدة
- نعم، أنصح
- محايد
- لا، لا أنصح
- لا، لا أنصح بشدة

لماذا؟
.....

* هل تظن ان "رفع معامل" مادة اللغة الإنجليزية سيؤثر على زيادة مستوى اهتمامك بتعلم اللغة الإنجليزية؟

- نعم، سيحسن موقفي تجاه تعلم اللغة الإنجليزية و سأعطي أولوية لجهودي وفقًا لذلك
- إلى حد ما ، ولكن هناك عوامل أخرى تؤثر على استعدادي وموقفي تجاه تعلم اللغة الإنجليزية
- محايد
- ستكون لها تأثير محدود على استعدادي وموقفي من تعلم اللغة الانجليزية
- لا، لن يؤثر اطلاقا

Appendix N: ESP Teacher Post-Study Interview

Theme 1: Readiness for Alternative Teaching Approaches

1- Are you open to adopting alternative teaching methods, such as the flipped classroom method?

- **a)** Yes.
- **b)** No
- **c)** unsure; more experts' support and guidance is needed for an effective transition

2- Was the designed English course effective for creating engaging pre-recorded materials, designing meaningful in-class activities, and managing student interactions in a flipped classroom?

- a) Yes, it is highly effective.
- b) It is somewhat effective.
- c) No, it needs improvement.

Theme 2: Language Problems and Instructional Language

3- What language problems do your students encounter when applying the flipped classroom model? Select multiple options if applicable

- a) Vocabulary difficulties

b) Grammar errors

c) Pronunciation issues

d) Limited speaking or writing skills

e) Reading comprehension struggles

f) Listening comprehension difficulties

g) Sentence structure problems

h) Trouble with idioms and expressions

i) Inconsistent use of tenses

j) Others

4- What challenges do you face when implementing the flipped classroom model? Please select all that apply

a) Student engagement and motivation

b) Creating and curating quality pre-recorded materials

c) Designing effective in-class activities

d) Managing student interactions and collaboration

e) Ensuring access to necessary technology and resources

f) Evaluating student progress and providing feedback

g) Balancing flipped learning with other instructional methods

h) Addressing individual student needs and learning styles

i) Time management and workload

j) Training and supporting teachers in the implementation of flipped classrooms.

5- What technical problems do you face when teaching online? Please select all that apply

a) Internet connectivity issues (slow connections, frequent disconnections, network overload, weak Wi-Fi signals)
b) Audio or video quality problems
c) Difficulty in sharing or accessing online materials
d) Problems with video conferencing software or platforms
e) Limited availability of necessary technology or devices
f) Troubles with online collaboration tools
g) Managing student access and permissions
h) Dealing with software compatibility issues
i) Security and privacy concerns
j) Challenges in troubleshooting technical problems remotely

Theme 3: Student Improvement and Impact of English

6- Do you think that students improve by the end of implemented English course?

a) Yes, there is noticeable improvement.
b) Somewhat, there is some improvement.
c) No, there is limited improvement.

Theme 4: Flipped Classroom Model (FCM)

7- Is the flipped classroom model easy to implement?

a) Yes, it is easy to implement.
b) It is somewhat easy to implement.
c) It is somewhat difficult to implement.
d) It is very difficult to implement

8- If you find this type of teaching difficult, please justify why? Please select all that apply

a) Limited access to technology or resources for viewing and evaluating pre-class materials.
b) Insufficient time for adequately viewing and evaluating pre-class activities.
c) Difficulty in finding or creating suitable digital materials (e.g. videos) for students.
d) Challenges in facilitating post-class engagement, personalized support, and effective assessment
e) Lack of technical skills or knowledge required for implementing the flipped classroom model.
f) Lack of training in implementing flipped classroom model
g) Limited student access to necessary technology or internet connectivity outside of the classroom.
h) Resistance from students towards the online sessions
i) Difficulty in time management and balancing in-class and out-of-class activities in the flipped model
j) Lack of alignment between the flipped classroom model and institutional or educational policies and guidelines.
k) Other (please specify).

9- Do you recommend the use of the flipped classroom in teaching English in the future?

a) Yes, I highly recommend it for teaching English.
b) I somewhat recommend it for teaching English.
c) It depends on the specific context and objectives, considering factors such as learner needs, subject matter, materials, and learning results.
d) No, I do not recommend its use

e) Not sure, additional time and practice are necessary to make a final decision

Theme 5: Challenges in Managing Student Interactions, Behaviour and Attention

10- What challenges did you encounter in managing student interactions while implementing the flipped classroom approach?

11- What is a common challenge in managing student interactions?

a) Lack of student engagement

b) Limited resources

c) Inadequate technology

d) Insufficient curriculum

12- Which of the following is the result of the troubles made or which of the following is a strategy to address conflicts during student interactions?

a) Encouraging off-topic discussions

b) Ignoring conflicts

c) Redirecting discussions to the intended learning goals

d) Avoiding student collaboration

13- What results can be expected from the challenges of managing student interactions, behaviour, and attention?

a) Decreased student engagement and participation

b) Disrupted learning environment and decreased productivity

c) Increased disciplinary issues and disruptions

d) Challenges in maintaining a positive classroom atmosphere and fostering effective communication

14- What are some recommended strategies to effectively address and eliminate the challenges of managing student interactions, behavior, and attention?

a) Implementing clear expectations and guidelines for behavior

b) Encouraging more off-topic discussions

c) Ignoring conflicts and disruptive behaviors

d) Avoiding interventions for persistent behavioral issues

a) Establishing clear behavior expectations and guidelines

b) Encouraging positive and respectful communication among students

c) Implementing proactive classroom management techniques

d) Providing individualized support and interventions for students with specific needs

e) Implementing effective engagement strategies to maintain student focus

f) Collaborating with parents/guardians to address behavioral concerns

g) Regularly assessing and adjusting instructional strategies to meet student needs

Theme 6: Lack of Presence and Participation in Sessions

15- Why were students absent from the face-to-face sessions of English?

a) Personal preference for online learning over in-person sessions

b) Lack of motivation or interest in the sessions of English

c) Clashing time commitments with the English classes programming (e.g. Family responsibilities, part-time employment)

d) Transportation difficulties or limitations

e) Lack of engagement or interactive teaching methods during the sessions

f) Limited access to necessary resources or materials for the face-to-face sessions

16- Why was there a lack of participation in online sessions?

a) Technical and internet access problems

b) Limited access to necessary technology devices and internet resources (videos, webinars, online databases, learning platforms)

c) Lack of engagement and interactive elements in the online sessions

d) Challenges with navigating online platforms or tools

e) Lack of motivation or interest in the subject matter during online sessions

f) Distractions or competing priorities at home

g) Scheduling conflicts or time zone differences

h) Insufficient communication and clear instructions for online participation

Theme 7: Attitude and Care towards English

17- Would raising the coefficient of English increase your students' interest and engagement with the subject?

a) Yes, it would likely increase interest and engagement.

b) No, it would likely reduce interest and engagement.

c) No, it would not significantly change interest and engagement.

d) Students' interest and engagement with the session of English would depend on other factors beyond just the English coefficient.

Theme 8: Program Support in Teaching

18- Did the designed English course using flipped classroom enhance your teaching practice?

a) Yes, it significantly enhanced my teaching effectiveness.

b) No, it had little to no impact on my teaching.

c) Yes, it provided some useful enhancements to my teaching.

d) The enhancement of my teaching practices depended on other factors

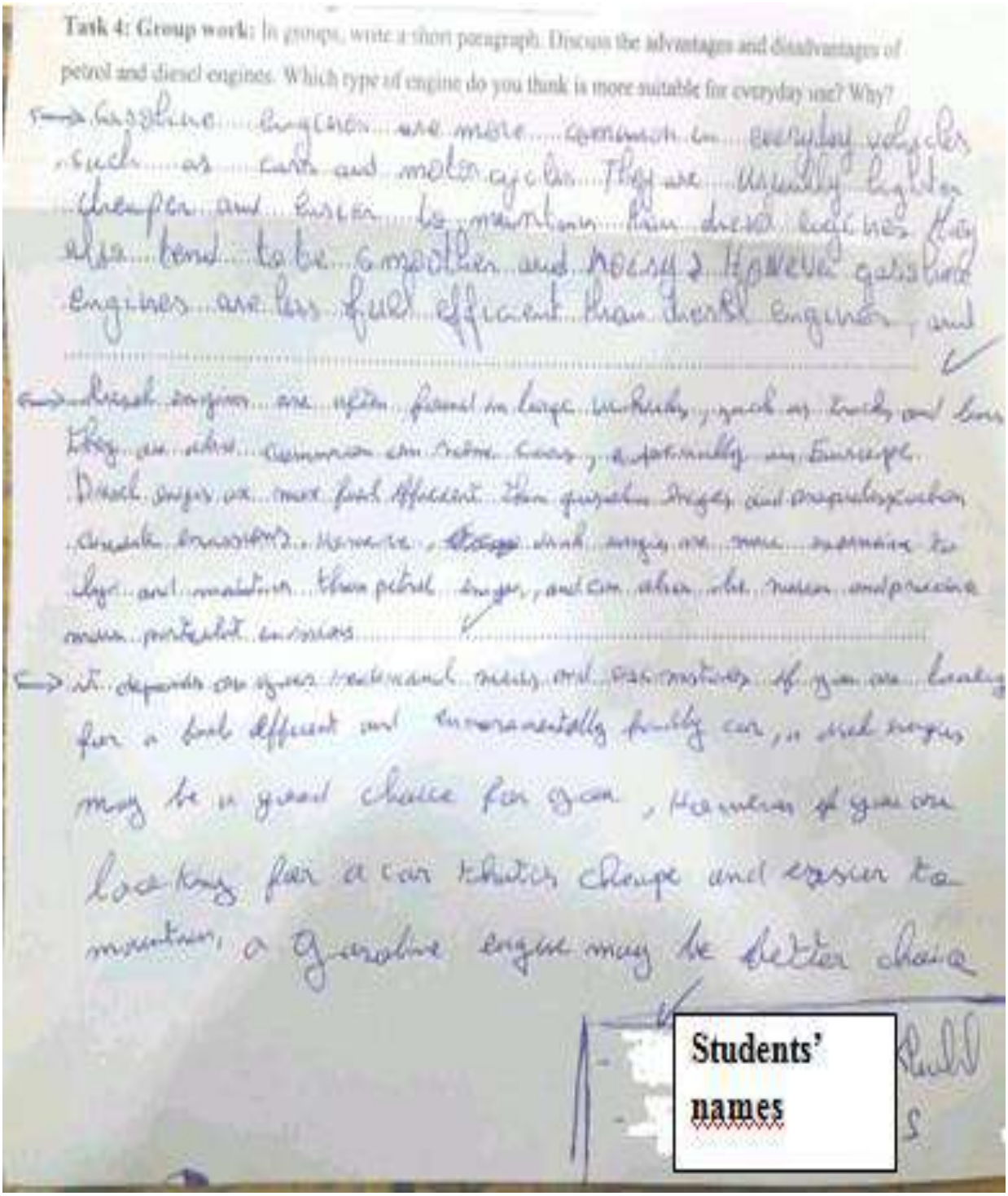
Whatever option you selected, please explain why?

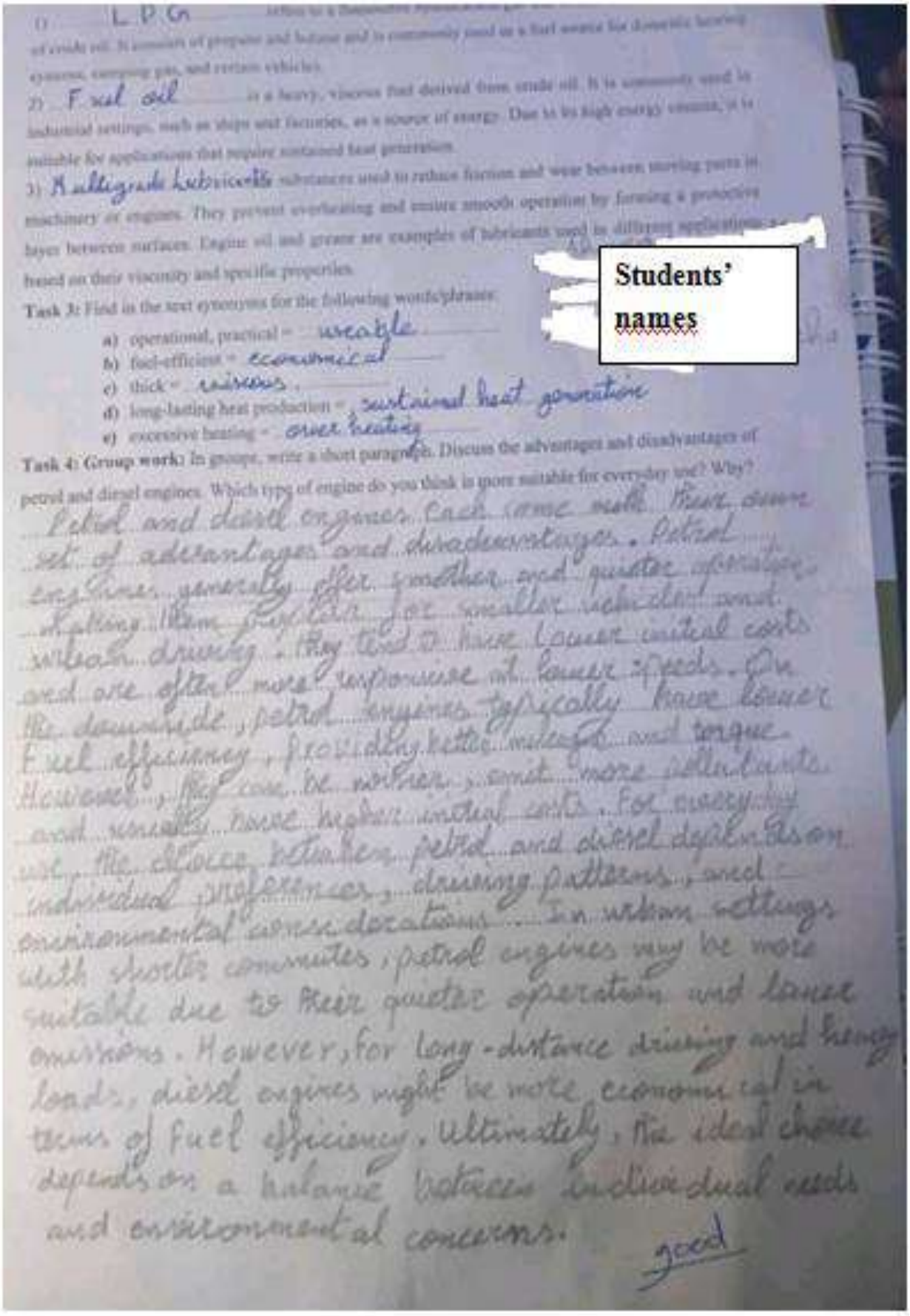
.....

19- In your experience with learning English, what strategies or approaches do you believe can be employed to enhance interest and engagement during an English session?

.....

Appendix O: Samples of Learners' Responses to Group Work Activities





1) L P G refers to a [illegible] of crude oil. It consists of propane and butane and is commonly used as a fuel source for domestic heating systems, emerging gas, and certain vehicles.

2) Fuel oil is a heavy, viscous fuel derived from crude oil. It is commonly used in industrial settings, such as ships and factories, as a source of energy. Due to its high energy content, it is suitable for applications that require sustained heat generation.

3) Multigrade Lubricants substances used to reduce friction and wear between moving parts in machinery or engines. They prevent overheating and ensure smooth operation by forming a protective layer between surfaces. Engine oil and grease are examples of lubricants used in different applications based on their viscosity and specific properties.

Students' names

Task 3: Find in the text synonyms for the following words/phrases:

a) operational, practical – workable
b) fuel-efficient – economical
c) thick – viscous
d) long-lasting heat production – sustained heat generation
e) excessive heating – over heating

Task 4: Group work: In groups, write a short paragraph. Discuss the advantages and disadvantages of petrol and diesel engines. Which type of engine do you think is more suitable for everyday use? Why?

Petrol and diesel engines each come with their own set of advantages and disadvantages. Petrol engines generally offer smoother and quieter operation, making them popular for smaller vehicles and urban driving. They tend to have lower initial costs and are often more responsive at lower speeds. On the downside, petrol engines typically have lower fuel efficiency, providing better mileage and torque. However, they can be noisier, emit more pollutants and sometimes have higher initial costs. For every day use, the choice between petrol and diesel depends on individual preferences, driving patterns, and environmental considerations. In urban settings with shorter commutes, petrol engines may be more suitable due to their quieter operation and lower emissions. However, for long-distance driving and heavy loads, diesel engines might be more economical in terms of fuel efficiency. Ultimately, the ideal choice depends on a balance between individual needs and environmental concerns.

good