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Samira OUNOKI

Title

The Assessment of the ESP Syllabus of Hydraulics Subject Area:

The case of first year LMD students of hydraulics at Mohamed Khider University of Biksra

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Dissertation Submitted to the Department of Foreign Languages as Partial Fulfillment of the Requirements for the Degree of Master in Sciences of Language

Board of Examiners

Dr. **KACHA Asma**	MCA	Biskra	President
Dr. **Ahmed BASHAR**	MAA	Biskra	Supervisor
Mr. **Khaled AMRAOUI**	MAA	Biskra	Examiner

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DECLARATION

I **Samira OUNOKI**, do hereby declare that this submitted work is my original work and has not previously been submitted for any institution or university for a degree. I also declare that a list of references is provided forward indicating all the sources of the cited and quoted information. This work was certified and completed at Mohammed KHEIDER University of Biskra.

Algeria

Certified:

Miss. **Samira OUNOKI**

Master student, Department of English

Signature:

DEDICATIONS

To my loving mother

In the memory of my father

To my Husband Adel

To my kids : Fouad, Hassane, and Lina

To my sisters and brothers

To my nieces and nephews

To my Oxford dictionary: Horiya Rekibi

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ABSTRACT

English for specific purposes (ESP) rose as one of the most influential approach at both levels academic and professional. ESP provides relevant teaching if the course is well-designed and takes into account all the required features. Teaching and learning ESP in the hydraulics division in the department of civil engineering and hydraulics in the University of Biskra encounters a number of problems for several reasons, such as the lack of a suitable ESP syllabus, the limited allocated time, and the deficiency in teaching materials. On this fact, the present research investigated and assessed the current, intuitive Hydraulics ESP syllabus and the effectiveness of the redesigned, comprehensive experimental syllabus. Population of interest was first year LMD students of hydraulics at Mohamed Khider University of Biksra. A quasi-experiment was the rational choice of design to best test what the research has hypothesized. The instruments of needs analysis through questionnaires, treatment, and testing were employed for data gathering. The consolidated results, after analysis and interpretation, demonstrated the effectiveness of the redesigned comprehensive ESP syllabus. The student participants demonstrated motivation towards the task diversity and apparent interactivity in the classroom. Accordingly, the adoption and adaptation of the redesigned comprehensive Hydraulics ESP syllabus is advisable in the technical fields.

Keywords: **ESP, Hydraulics, technical fields, syllabus**

LIST OF ABBREVIATION AND ACRONYMS

ACRONYMS

ESP: English for Specific Purposes

L1: First Language

L2: Second Language

EFL: English as a Foreign Language

GE: General English

ABBREVIATIONS

et al: Et alia, to refer to a multiple authors source

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Study Background and Literature Review

Chapter I: Study Background and Literature Review

1.1 Study General Introduction

A pleasant and welcomed invasion is that of the English language. English has invaded the world and established itself on every existing level. There is a common agreement that the English language has evolved into the international language of science and technology. A fact that encouraged a large number of academics and scientists to consider learning it in order to manage their various receptive and productive activities. The dire need for a specific English instead of a general English to accomplish those various activities gave birth to the discipline of English for specific purposes (henceforth ESP). ESP was adopted in higher academic levels to answer to the growing needs of students specialized in specific fields either professional, academic, scientific and so on.

1.1.1 Background of the study

The field of technology is among the most concerned with recent scientific developments, which request access to information mainly published in English. As a result, teaching such a language to students majoring in technology seems to be more than a requirement in order to get a job or to prepare for their future academic career. However, these students are not concerned with general English, which contains large body of grammar rules, language structure, and unlimited general vocabulary; they want English that fits their specific needs, purposes, and context. Consequently, ESP has become one of the most widespread scholarly topics over the previous decade, and has been established as an independent academic discipline. Hence, the interest in assessing and redesigning an ESP syllabus for hydraulics students.

1.1.2 Problem Statement

Despite its vital importance, ESP is still regarded as an additional, ancillary course in the Algerian universities especially in the field of technology. In teaching English in the engineering disciplines, content-area instructors seem to continue focusing specifically on technical words, all the more ignoring the related grammar, language structure, and general vocabulary or even teaching General English as a springboard for teaching ESP. An observable fact particularly when the instruction is carried out by an untrained ESP teacher. ESP instructors marginalize the integration of most aspects of the scientific discipline is an unfortunate current reality.

The current unfortunate situation is widespread and field of hydraulics at M. K. University of Biskra is no exception.

Teaching and learning ESP in the hydraulics field at its different levels encounters a number of problems for several reasons, such as the limited allocated time (one session per week), the lack of a suitable ESP syllabus, and also the lack of appropriate teaching materials. Considerations of the learners' levels, needs, and goals are practically almost absent. Furthermore, instructional decisions such as course topic, method, and assessment are not focused on learners' motivations for learning (Meddour, 2014). Thus, the need for a specific syllabus that meets learners' expectations, needs, and objectives is very crucial in the determination of the usefulness and priority of each language skill to increase the learner's ability of efficiently accomplishing the specific academic and professional tasks.

1.1.3 Research Questions

On the previously mentioned problem, the research poses the following questions:

Q1: Why is there a dire need for the revision and assessment of the old syllabus?

Q2: What are the pitfalls of the previous intuitively designed syllabus?

Q3: What do hydraulics learners expect and need from studying English?

1.1.4 Research Hypothesis

On the previously enumerated question, the research lays the following hypothesis: (H_a signifies alternative hypothesis, and H_0 signifies null hypothesis):

H_a: If students in the hydraulics field learn English from a syllabus specifically designed to meet their needs and rises to their expectations, their competency in English will be significantly improved.

H_0: If students in the hydraulics field learn English from a syllabus specifically designed to meet their needs and rises to their expectations, their competency in English will not be significantly improved.

1.1.5 Research Objectives

The current study undertakes the assessment of the intuitively-designed, ad hoc ESP syllabus for hydraulic learners with a view of designing a well-designed syllabus based on a thorough needs analysis and teachers' awareness; the focus will be first-year undergraduate students of hydraulics at M.K. University of Biskra. To achieve this purpose, the following objectives are set up:

1- To evaluate the current situation of English teaching and learning in the hydraulics field.
2- To identify the needs of hydraulics students for creating a suitable syllabus.
3- To design a practical ESP syllabus that rises to expectations and meets the needs of the stakeholders (i.e., students, teachers, and administrators).

1.1.6 Research Significance

The anticipated impact of the present research could be seen on three levels. The first level is the devising a tentative syllabus based on the needs analysis of the Hydraulics students that if successful could be adopted and adapted by ESP teachers to other technical fields instead of the existing rigid intuitively designed syllabuses. The second level is a humble contribution to the literature in the form of a needs analysis model that could be utilized in future research. In addition to delivering results that could work as grounds for future research. The third level is student-related in terms of providing specific instruction that is mainly based on their present gains and lacks as well as target needs and desires.

1.1.7 Research Delimitations

Delimitation to the present study can be condensed in the following three elements:

1.7.1.1. Time delimitation. The research was carried out over the first semester of the academic year 2022-2023.

1.7.1.2. Space delimitation. The research took place in the department Civil Engineering and Hydraulics at M.K University of Biskra in Algeria.

1.7.1.3. Topic delimitation. The research topic is the revising of a proper ESP syllabus that would serve students' specific needs and expectations instead of the intuitive syllabus that serve only general needs.

1.1.8 Methodology Overview

The research chief objective is the assessment of the ESP syllabus of the Hydraulics subject area and the re-design pressing need into a more appropriate and comprehensive

syllabus. To the accomplishment of this objective, the research adopted a linear approach as it was valued as the most suitable. A quantitative approach was judged as befitting to answer the research questions through the two instruments of questionnaire and a quasi-experimental treatment. The experimentation took form of the one group pretest-post-test design. The yielded results from the two instruments would serve answers for assessment and reformation basis for the redesign.

1.1.9 Research Structure

The research structure took a three chapter model. The first chapter accommodates the theoretical side of the research in two sections. The first theoretical section comprises the research background, problem statement, questions, hypotheses, objectives, significance, delimitations, methodology, and finally an overview of the research structure. The second theoretical section contains the elements of the review of the literature. The second chapter frames the research methodology. The chapter details on paradigm, approach, design, population and sample, instruments, and the various implementations procedures. The third chapter encompasses the practical side of the research in three sections. The first practical section analyzes and interprets the data both descriptively and inferentially. The second practical section discusses the findings with reference to the research questions and hypothesis. However the last section concludes by summarizing the research at large, commenting on limitations, suggesting for future research, and lastly recommending for course and syllabus designers.

1.2 Review of the literature

Introduction

Due to globalization, the use of the English language is gaining worldwide appeal in numerous sectors of society. Currently, English has become the most widely used Lingua Franca of the century. Previously, English was taught within the framework of English literature and culture, either for educational or recreational purposes. Nowadays, English is an international language of science, technology, medicine, business, politics, academic instruction, and so on. As a result, English should be taught purposefully in order to suit the diverse needs of new types of learners and enhance their proficiency. The emergence of ESP as a field of English language teaching has significantly aided in that process.

This section aims to define and describe ESP, delineate its roots and progress, investigate the point of departure for ESP courses, which is Needs analysis, and present chief approaches to course design.

1.2.1 ESP definition and description

ESP definition has evolved in both theory and practice throughout the last 50 years, which make providing an exact definition a difficult task, as Strevens (1988) reported "producing a simple and straightforward definition of ESP is not an easy task" (p. 109). ESP is defined differently from one scholar to another according to some conditions and circumstances, such as learners' current and future needs and objectives, their specific area of study, their future jobs and careers, and the needed language skills.

For instance, Hutchinson and Waters (1987) regard ESP as a subfield of ELT, in which the core key is the learner's needs "ESP must be seen as an approach not as a product. ESP is not a particular kind of language or methodology …. it is an approach to language learning, which is based on learner need"(p. 19) . According to Robinson (1991), ESP is "normally goal-directed" (p. 2), which means that leaners study English as a means for study or work. Dudley-Evans and St. John (1998), have modified Strevens' (1988) definition and define ESP in terms of 'absolute' and 'variable' characteristics.

A- Absolute Characteristics

1. ESP is defined in terms of the learners' specific needs.

2. ESP makes use of underlying methodology and activities of the discipline it serves.

3. ESP is centered on the language appropriate to these activities in terms of grammar, lexis, register, study skills, discourse and genres appropriate to these activities.

B- Variable Characteristics

1. ESP may be related to or designed for specific disciplines

2. ESP may use, in specific teaching situations, a different methodology from that of General English

3. ESP is likely to be designed for adult learners, either at a tertiary level institution or in a professional work situation. It could, however, be for learners at secondary school level.

4. ESP is generally designed for intermediate or advanced Students.

5. Most ESP courses assume some basic knowledge of the language system, but it can be used with beginners.

The absolute characteristics of ESP can be shared with any field of ESP; however, the variable characteristics change from one branch of ESP to another. It can be noticed that the methodology of teaching ESP was given more attention because it generates the interaction between the teacher and the learners and between learners themselves, which makes students more engaged and motivated.

Far from ESP characteristics, Nunan (2005) describes ESP as" a tool for communication rather than as sets of phonological, grammatical and lexical items to be memorized led to the notion of developing learning programs to reflect the different communicative needs of disparate groups of learners" (p. 4). This implies that ESP focus shifts from a pure linguistic side to a communicative side, and the importance is the use of concepts in real life situation.

The last definition of ESP is provided by Basturkmen (2010, p. 4) in which ESP is seen as a narrow scope of general English that concentrates on learners' aim of learning and the courses that are tailored to their needs in their study or career areas. Basturkmen declares that:

> ESP courses are narrower in focus than general ELT courses because they center on analysis of learners' needs. The statements show that ESP views learners in terms of their work or study roles and that ESP courses focus on work- or study-related needs, not personal needs or general interests.

1.2.2 The rise and development of ESP

Due to economic, linguistic, and psychological factors, ESP as a subfield of ELT has emerged and developed. Despite the fact that technology and commerce widely contributed to the advancement of humanity, they led to the emergence of a worldwide language in which learners knew their specific objectives and were aware of their needs. "Situations where the student has some specific reasons for wanting to learn a language" (Harmer, 1983).

In addition to the World Oil Crisis of the early 1970s, which demonstrated the worth of English as a language of knowledge, particularly among the rich countries, "English suddenly became big business and commercial pressures began to exert an influence" (Hutchinson and Waters, 1987). The emergence of ESP was also impacted by the revolution in linguistics, explained through the shift from language property descriptions by traditional

linguists to the way language is used in real communication. Hutchinson and Waters (1987) came to the conclusion that spoken and written English differed as a result of this new approach to English. English, in other words, can change depending on the context. As a result, various attempts to characterize English for science and technology were made in the late 1960s and early 1970s. The last factor that impacted ESP development is psychological related to the manner in which learners acquire the language. Much focus was given to the learners' strategies used to grasp and obtain knowledge and the language skills. The sense of purpose gives the language work immediacy and a relevance which is perhaps not always found in other sectors of ELT, particularly of the 'General English' variety" that is employed to express needs and interests. This led to the appearance of what became known as the "learner-centered- approach."

1.2.3 ESP vs GE

Boundaries between GE and ESP is blurred because ESP is a subdivision of language teaching. GE and ESP have more in common especially in theory than in differences particularly in practice. The distinction between ESP and GE is not in the presence of a need, but rather in the 'awareness' of a need. The needs also exist in GE, but the learners are not aware of why they need to learn English. In contrast, ESP learners are conscious of their needs on which ESP syllabus is based. Learners' awareness of their needs has significant influence on the content that will be designed as well as on the teaching methodology that will be selected, as Widdowson (1981) argued "if a group of learners 'needs for a language can be accurately specified, then this specification can be used to determine the content of a language programme that will meet these needs." (p. 89). Moreover, GE has broad goal to achieve; however, ESP emphasizes mainly specific purposes, methodology, and the activities that serve the disciplines, in addition to the grammar and language skills. In this context, Harding (2007) reported "The sense of purpose gives the language work immediacy and a relevance which is perhaps not always found in other sectors of ELT, particularly of the 'General English' variety" (p. 6).

The differences between ESP and GE can be recapitulated as follow:

- Unlike GE that includes all the language concepts and grammar rules, ESP syllabus is selective, and not all language structures is included even if it is important. In ESP the importance of language feature is not the only criteria.

- ESP learners are more motivated than GE learners since the former are aware of their specific needs and objectives, as Harding (2007, p. 8-9) stated

  > The type of ESP learners who come to ESP are often demotivated by courses of general English. These learners have entered ESP courses because they expected that language-based work would not owe to practical or manual skills in lessons.

- Generally, ESP learners are more mature cognitively and physically (age) with reasonable competence in language areas compared to GE.
- Unlike GE that is a continuous process to reach proficiency level, ESP courses have short-time periods. Robinson (1980, p.9) introduces the factor time and distinguishes between long term process of learning GE and short duration in learning ESP.
- In ESP, narrowing the language contents, skills needed, vocabulary items, is highly required, as Strevens (1980, qtd. in Robinson, 1980) "the learners will need; selection of the items of vocabulary, patterns of grammar and functions of language; themes and topics narrowing in order to include only the themes, topics and discourse needed; practice of purposeful communicative needs." (p. 12-13). One can note that specific the course should be interest of target audience. Generally, wide-angled courses is designed for a more general a group of learners (heterogeneous), whereas narrow-angled course is designed for a specific group of learners (homogeneous).
- The last difference is that ESP is a negotiated syllabus or partnership syllabus since it is not related to an individual decision, various partners are concerned, such as teacher, learner, content-teacher, administration, course-designer, sponsor … and so on. However, GE syllabus is designed by the ministry of education.

1.2.4 Needs analysis

Needs analysis is considered as the point of departure and the main component in ESP course design. For instance, Richards et al (2002) defined NA as being "the process of determining the needs for which a learner or group of learners requires a language and arranging the needs according to priorities" (p. 353-354). This means that learners' needs should be classified according to their importance towards learners' purposes. Furthermore, Johns and Price-Machada (2001) claim that needs analysis is an obligatory phase in course design: 'In every genuine ESP course, needs assessment is obligatory, and in many programs, an ongoing needs assessment is integral to curriculum design and evaluation.'(p. 49). Needs analysis is the stage that aims to identify what specific language content, skills,

materials, and methodology ESP learners will need in order to refine the content of ESP course. It is also used to determine learners' characteristics, their leaning styles, attitudes and objectives. Moreover, needs analysis is utilized to assess learners and learning process at the end of the course.

ESP syllabus based on NA appears to be more effective and the learners are more motivated because their current needs, ideas and views are taken into consideration. Needs analysis figures out the gap that exists between what learners know and learners want to know, as Basturkmen and Elder (2004) concluded that "needs analysis has been seen as the attempt to identify the gap between what students know and can do at the present point of time and what they need ideally to be able to do in the target situation." (p.674). As result of needs analysis, ESP course designer can determine and comprehend the culture of specialism (Harding, 2007. 17) as well as the micro-skills integrated in learners' study or work setting (Basturkmen, 2006). Needs analysis has changed over the years from simple pre-course technique involving analysis of the target situation to including, in addition to the analysis of language use and skills in the target situation, the learners' factors analysis as well as teaching context factors.

In the early days, needs analysists were primarily concerned with necessities or objectives that ESP learners want to achieve in the target situation, such as which language content, skills, and activity were more or less important at the end of learning process. Later, the notion of needs analysis was broadened to include deficiency analysis (learners' weaknesses), strategy analysis (the favored approaches and methods in teaching and learning), and means analysis (how the course will be run), and learners' profile (current proficiency, subjective needs, previous learning experiences, cultural information, reason of attending the course, and attitude scales) (West, 1997; Dudley-Evans and St John, 1998; Basturkmen, 2010).

In fact, needs analysis is a continuous process; the decision should not be definitive, a pause of reflection has to be set in form of formative assessment not for learners to be graded but for assessing the course to make it more effective. Various techniques are used to gather the necessary data for needs analysis, such as questionnaires, analyses authentic spoken and written texts, structured interviews, observation, and results assessment. Several models of needs analysis were elaborated in language teaching, for instance, Richterich's (1972) model, Munby's (1978) Communicative Needs Processor (CNP) model, and Richterich and Chancerel's (1980) model,

1.2.5 Approaches to needs analysis

Based on the Munby (1978) model, Hutchinson and Waters (1987) model, and Dudley-Evans and St. John (1998) model, Jordan (1997) distinguished five main approaches to needs analysis: Target-Situation Analysis, Present Situation Analysis, Deficiency Analysis, Strategy Analysis and Means Analysis.

1.2.5.1. Target situation analysis (TSA). Early needs analysis focused mostly on linguistic and register analysis (discrete language items of grammar and vocabulary). However, needs analysis shifted toward putting the learner's objectives at the center of the framework of needs analysis after the publication of Munby's Communicative Syllabus Design (1978). As a result, the concept of target needs became extremely important. Chambers (1980) was the first to use the term target situation analysis in his famous article 'A re-evaluation of needs analysis' where he attempted to clear the confusion of terminology. According to Jordan (1997), Munby's model (1978) better described the target situation analysis by emphasizing on the learners' needs at the end of a language course and the target level performance.

The most important element in Munby's model (1978) is the communicative needs processor (CNP), which considers the factors that impact communication and classifying them as parameters in an active relationship with each other (Munby 1978, p. 32 as cited in Songhori 2008). For Hutchinson and Waters (1987, p. 59), the target situation analysis requires asking questions about the target situation and learners' attitudes towards that situation in the learning process. Songhori (2008: 8) approaches Munby's model to Hutchinson and Waters' framework as follows:

Table 1

Hutchinson and Waters' Framework Vs Munby's Model (Songhori 2008 as cited in Meddour, 2014)

Hutchinson and Waters' framework	Munby's model
1. Why is language needed? • for study; • for work; • for training; • for a combination of these; • for some other purposes, e.g. status, examination, promotion	Purposive domain
2. How will the language be used? • Medium: speaking, writing, reading, etc.; • Channel: e.g. telephone, face to face; • Types of text or discourse: e.g. academic text, lectures, catalogues, etc.	Instrumentality
3. What will the content areas be? • Subjects: e.g. medicine, biology, commerce, shipping, etc.; • Level: technician, craftsman, postgraduate, etc.	Communicative event
4. Where will the language be used? • Physical setting: e.g. office, lecture theater, hotel, workshop, library; • Human context: alone, meetings, demonstrations, on telephone; • Linguistic context: e.g. in own country, abroad.	Setting (physical and psychological)
5. When will the language be used? • Concurrently with the ESP course or subsequently; • Frequently, seldom, in small amounts, in large chunks.	

Target situation analysis is related to what learners need to reach at the end of the ESP course; the desired level they want to attain. It is mainly expressed in terms of necessities demanded by the target situation, lacks or weaknesses, which indicate the gap between what learners need to know and what they already know, in addition to the learners' subjective

needs expressed in terms of learners' attitudes, readiness, and motivation to learn (Jordan, 1997).

1.2.5.2. Present situation analysis (PSA). The Present situation analysis describes the learners' ability in learning English at the beginning of the course in terms of strengths and difficulties in language, skills and previous learning experiences. It is also related to the factors influencing the way of learning, such as cultural factors and learners' attitudes to the English language course (Robinson, 1991; Jordan, 1997; Dudley-Evans and St. John, 1998; Basturkmen, 2006). In order to effectively meet the learners' needs and achieve the wanted aims, both target situation analysis and present situation analysis have to be combined (Songhori, 2008).

1.2.5.3. Pedagogic needs analysis. "Pedagogic needs analysis" is an umbrella term used to designate three components of needs analysis: deficiency analysis, strategy or learning needs analysis, and means analysis. According to West (1998), the shortcomings of target needs analysis should be indemnified through gathering data about the learner and the learning environment. Deficiency analysis represents the requirements that learner lacks (Jordan, 1997, p. 26). It is the difference between the current language competence of learner and the target competence. Concerning learning needs analysis, Alwright (1982) was the pioneer of this approach in which learners' opinions and insights represent the heart of strategy analysis. The latter emphasized "the methodology employed to implement language programmes" (Nunan 1988).

It attempts to draw how the learners desire to learn (learners' preferred learning style), and which ways, strategies, and techniques enable them to attain the end target. It can be noted that the motivation and the learning process should be taken into account in addition to students' learning differences (Dudley-Evan & St. John, 1998). The last element of pedagogic needs analysis concerns means analysis. The latter was introduced in order to adapt the language course to local or specific situation. Means analysis is related to the environment where a course will be run (Dudley-Evans and St John 1998, p. 124). According to West (1998), means analysis attempts to examine what Munby does not take into consideration, such as the practicality and workability of the language course. Mean analysis represents the external factor that impact the learning process, it is about what works well in one situation may not work well in another.

1.2.5.4. Register analysis. Register analysis was associated with the works of Strevens, Halliday, McIntosh, Swales, Herbert, and Twer and Latoure. It was the main tendency during the 1960's. Register analysis treats mainly the grammar and vocabulary of scientific and technical English. It appears that certain grammatical and lexical forms are used much more frequently than others in English for Science and Technology (EST). For instance, the present simple, passive voice forms, and compound nouns are used more often than other grammatical forms. Register analysis emphasizes the language features that learners will need to employ while ignoring other forms that are not as important. Hutchinson and Waters (1987, p. 10) reported that, "The aim was to produce a syllabus which gave high priority to the language forms students would meet in their science studies and in turn would give low priority to forms they wouldn't meet". Several scholars criticized this approach because the text analysis is limited to the word and sentence level, it is descriptive rather than explanatory, and it lacks authenticity (West, 1998; Robinson, 1991; Dudley-Evans and St. John, 1998).

1.2.5.5. Discourse analysis. The pioneers of this approach are Lackstrom, Selinker, and Trimble (1973), Widdowson (1979), Bates and Dudley Evans (1976), and Nunan (1990), who stressed the primacy of language use over language form.

1.2.5.6. Genre analysis. Genre analysis is considered the most influential approach to the analysis of language use in ESP to date. It depicts how language is used in a specific situation, such as medical reports, conference abstract, legal writing. Genre analysis can be also identified as the way people in a specific context typically get things done through spoken or written discourse (Paltridge, 2006). Brown (2000) claims that genre analysis concentrates on the regularities of structures that differentiate one type of text from another.

In conclusion, it can be said that all the mentioned approaches to needs analysis should be combined in order to enhance learning process for the purpose to achieve an effective ESP course design.

1.2.6 ESP Teachers

ESP teachers are generally teacher of general English. Their responsibilities include investigating students' needs, outlining aims and objectives, deciding on and adjusting teaching materials, designing lessons, generating an adult-oriented learning environment, and evaluating students' progress. Despite the fact that these are typical teacher skills, particularly in the field of English teaching, ESP teachers has other roles to play since the

ESP course is mainly related to the specific field that is far from their abilities. Moreover, students are adults as well as specialists in their subjects. Students' evaluations combine their English proficiency and performance in their professional environment. Dudley-Evans and St. John (1998) preferred to employ the term ‘ESP practitioner’ to designate ESP teacher. They reported that the key roles of ESP practitioner are course designer, provider of materials, teacher of course, researcher, collaborator, and evaluator.

The major challenges of ESP teachers is that teachers are not specialists in the students’ professional fields. The primary issue in ESP teaching is the struggle to master the language and the subject matter, in addition to the difficulties of text selection and adaptation since the ESP teachers are not specialist in the field of study.

1.2.7 ESP Learners

ESP learners are different from general English learners especially in two aspects age and motivation. Generally, ESP learners are highly motivated adult intrinsically and extrinsically with specific academic or professional objectives to achieve. They are also aware of their needs and difficulties, conscious of their progress, and reflective on their own learning. ESP syllabus designer needs to take into account all these aspects in order to produce an effective ESP course.

1.2.8 English for science and technology (EST)

EST has a variety of discourses that evolved with the development of ESP. Swales was the leader scholar of this field. Most of his researches was related to the register analysis as concept of special language. The EST courses were designed on lexical criteria that included field terminology and grammar patterns. Later the concept of discourse analysis was integrated as a key stage in the development of ESP. Various scholars such as Lackstorm, Selinker &Trimble, 1973; Selinker, Todd Trimble & Trimble, 1976; Selinker et al. 1978; Trimble, 1985 identified two major rhetorical characteristics, which are rhetorical functions” and the specific “rhetorical techniques”. The rhetorical functions are the fundamental components utilized to analyze and explore written EST discourse, and they comprise description, definition, classification, instruction, and visual-verbal relationships between a visual aid and its accompanying text (e.g. the linking of text and a diagram, graph, etc.). The procedures considered rhetorical by the majority of ESP researchers, in fact, refer to the rhetorical elements that connect the material in an EST text.

According to Kittidhaworn (2001:19), they consist of two major categories: (1) the "natural patterns (orders)" of time order, space order, and causality and result; and (2) the "logical patterns" of causality and result, order of importance, comparison and contrast, analogy, exemplification and visual illustration (graphics). However, the textual devices that form a scientific piece of writing such as connectors, references and ellipsis are regularly found in written EST discourse, such as, first, then, finally, so that, hence, as result, consequently, and so on, which are the textual elements that build up the text. These different procedures are taught for the ESP learners, depending on the students' academic levels and English proficiency. Besides, the cohesion and the coherence of scientific texts are of chief rhetorical elements in any attempt led by ESP students.

1.2.9 ESP syllabus design

1.2.9.1. Definition of curriculum, syllabus, and course. Concerning the definition of curriculum, Shaw (1975) states that "... the curriculum includes the goals, objectives, content, processes, resources, and means of evaluation of all the learning experiences planned for pupils both in and out of the school and community, through classroom instruction and related programs..." (p. 83). For Allen (1984), Curriculum is "a very general concept involving consideration of the whole complex of philosophical, social, and administrative factors which contribute to the planning of an education programme" (p.64).

However, according to Lee(1980) "Syllabus is essentially a statement of what should be taught, year by year – through language – syllabuses often also contain points about the method of teaching and the time to be taken" (p08). Another opinion is that a "syllabus is a more detailed and operational statement of teaching and learning elements which translates the philosophy of the curriculum into a series of planned steps leading towards more narrowly defined objectives at each level" (Dubin & Olshtain, 1997, p.28). Consequently, a syllabus, as Jordan (1997) argues, involves "the selection, grading and sequencing of the language and other content, and the division of the content into units of manageable material". Then, from Nunan's point of view, syllabus is a sub-component of the planning phase of the curriculum consisting in the selection and grading of content. In contrast, Hutchinson and Waters (1996) defines a course as "an integrated series of teaching-learning experiences, whose ultimate aim is to lead the learners to a particular state of knowledge" (p.65).

From the above definitions, one can conclude that the curriculum is a wider notion compared to both syllabus and course. A curriculum is a policy statement that refers to a broad description of basic aims that reflect multiple perspectives on the teaching and learning of a subject, as well as perspectives on education philosophy and pedagogical process more widely. On the other hand, a syllabus is a more detailed statement that integrates the curriculum's broad goals into more specific objectives and incudes details on content and teaching procedures. A syllabus represents an outline/plan/list of a specific course prepared by the instructor. It comprises the topics to be covered, their order, the required and suggested reading material, and any other relevant information. The course seems to be the most narrowed out of the three terms, it is a unit of teaching that typically lasts one academic term that is led by one or more instructors and has a fixed roster of students. The most important is to keep in mind that a syllabus is a guide that can aid the learning process; however, it is the duty of the teacher to think about an appropriate methodology in order to make it alive.

1.2.9.2. Types of syllabi. For the purpose of improving the English language learning, a range of syllabi have been developed during the history of ELT. Their differences are primarily due to the specific assumptions and opinions held by syllabus designers regarding the approach to language learning and teaching. Generally, syllabi can be classified under two main categories: product/synthetic syllabus or process/analytical syllabus.

- **Product-oriented syllabus** focuses on what the leaner will know as result at the end of instruction. It makes use of instruction to emphasis students' learning. It usually includes a list of graded objects to be learnt. Product-oriented syllabus comprises grammatical syllabus, lexical, Functional-notional, and situational Syllabus.
- **Process-Oriented syllabus** concentrates on the pedagogical processes leading to the language outcomes. Recently, the focus of applied linguists has been oriented to the educational methods by which learners would attain their goals and improve their communicative language skills. As a result, significantly greater emphasis was placed on the specifications of the learning process via the use of tasks and activities. Process oriented syllabi contain: content based syllabus, skill based, task based, and competency based syllabus.

In the Situational syllabus, the primary purpose is to teach the language that occurs in real life situations. Here, the emphasis is on the learner, who is expected participate actively in the different situations where L2 is being spoken. Situational syllabuses offer the

advantage of providing language in context and teaching language that is immediately useful. This concept seems to fit ESP since the latter emphasizes the key role of the context where communication happens. In addition, the situational syllabus is a learner-centered approach than it is subject-centered.

To sum up, eclecticism/integrated syllabus is a common feature of the majority of course books that attempt to combine the various aspects of language has also been addressed by Hutchinson and Waters (1987) who state "Any teaching material must, in reality, operate several syllabuses at the same time. One of them will probably be used as the principal organizing feature, but the others are still there".

1.2.9.3. ESP course design. The fast development of the world economy and the revolution in applied linguistics has significantly contributed to the development of ESP. As being a sub-division of ELT, ESP has been heavily impacted by ELT methodology and its advancement. It appeared that the grammatical and lexical items of a specific area of English was the initial dominating approach to ESP course design. With the emergence of the communicative approach to L2 teaching over the last decades, the interest was shifted to language use that became the primary focus in ESP field, which was identified as the "functional-notional approach". In the early 1980s, some aspects, such as particular language use, learning process as well as the learning skills were highly needed to be taken into consideration. (Dudley-Evans & St John, 1998).

Generally, ESP course design is affected by three main interrelated factors: Language description, Learning theories, and Needs Analysis (figure 2) ((Hutchinson & Waters, 1987).

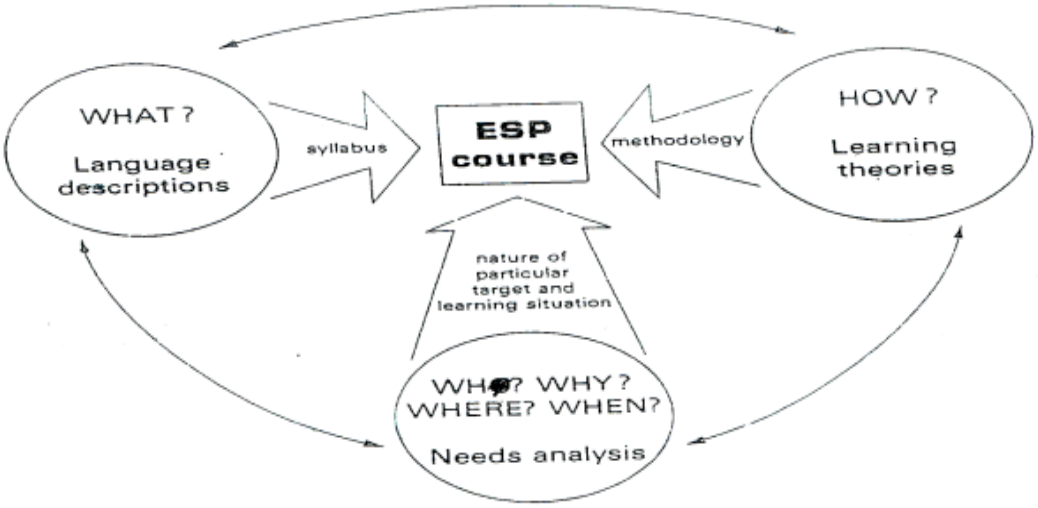

Figure 1. Factors Affecting ESP Course Design (Hutchinson & Waters, 1987)

- **Language description**: It is the way to follow in order to describe the language to attain the learning aim. There are several approaches to characterize language features in which various concepts of language has impacted ESP significantly, such as: Traditional grammar, structural linguistics, Transformational Generative Grammar (TGG), language Variation and Register Analysis, Functional / Notional Grammar, discourse analysis,
- **Learning theories:** A successful learning needs analyzing the language content as well as comprehending the structure and the mind processes because language represents human cognitive processes and language learning is influenced by the mind's observation, organization, and storage of information (Hutchinson and Waters 1987). Many learning theories have emerged especially after the establishment of the field of psychology as a respectable subject of scientific investigation, such as: Behaviorism, Cognitivism, Constructivism, and Gardners' eight intelligences.
- **Needs Analysis:** It is considered as the stepping stone of Any ESP course. Needs analysis is a continuous process that aims to identify, analyze, and assess the learners' needs before, during, and at the end of the ESP course.

The difficult task of ESP course designer is to guaranty the integration of the three mentioned factors into a syllabus since ESP is a learners-centered approach, which is not a fixed approach.

1.2.9.3.1. Steps of ESP course design. To plan an ESP course design, Graves (1996) proposed the following steps (figure 3)

1- - Conducting needs assessment,

2- Determining the goals and objectives of the course.

3- Conceptualizing the content.

4- Selecting and developing materials and activities.

5- Organizing the content and activities.

6- Evaluating

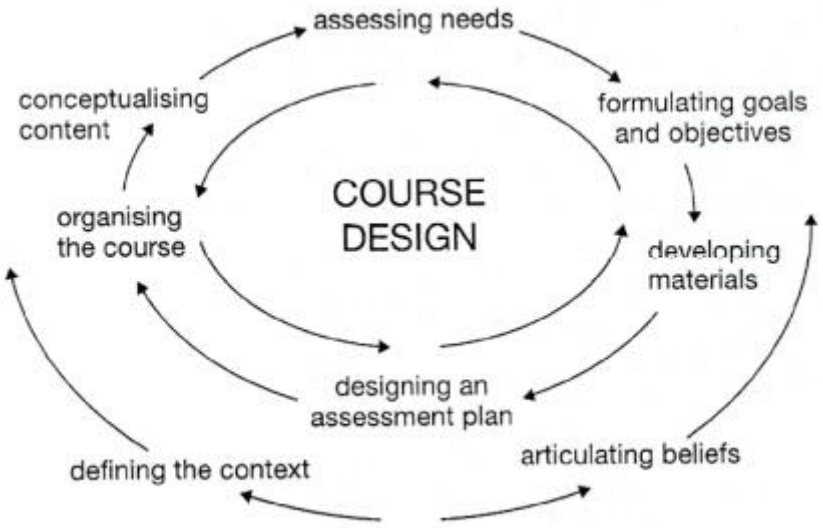

Figure 2. Graves' Model of Syllabus Design (Graves, 2000)

Syllabus design, according to Munby (1984), is "a matter of specifying the content that must be taught and then organizing it into a teaching syllabus of appropriate learning units." Moreover, syllabus design is defined as the structuring of selected contents into an orderly and practical sequence for teaching purposes. He suggests the following standards:

i. Progress from known to unknown matter,

ii. Appropriate size of teaching units,

iii. A proper variety of activity,

iv. Teachability and

v. Creating a sense of purpose for the student.

1.2.9.4. The English teaching and learning in the Hydraulics division. Although ESP has advanced significantly since the 1960s, the Algerian universities especially those of science and technology fields still regarded ESP as an ancillary course and limited the teaching of English to specific lexicon and translating texts through reading scientific and technical articles. The situation in the Department of Civil Engineering and Hydraulics at the University of Biskra is no exception. Hydraulics students (national division) start learning English in the second year for two semesters in license, then one semester at master's level. Teaching and learning ESP in the hydraulics division at different levels encounters a number of problems for several reasons:

*1.2.9.4.1. Time allocation***.** It is among the crucial factors that contributes to an effective teaching/learning process. When the allocated time is sufficient, the teacher can attain the planned aims and the expected competency from his students. Unfortunately, in the hydraulics division, just one session of 90 minutes per week in the form of a lecture is devoted for learning English during a maximum of 14 weeks for each semester. Obviously, it is not enough to satisfy the necessary needs, attain the target proficiency and allowed students to utilize English confidently in their subject of study. Moreover, what aggravates the situation is that the English session is frequently programmed late in the afternoon, when students are tired and unable to concentrate. Thus, results of the learning are usually poor.

*1.2.9.4.2. Absence of a syllabus***.** The main problematic in the department of Civil Engineering and Hydraulics at Biskra University is the absence of any program, syllabus, or curriculum of the ESP course, and if it exists, it does not meet students' needs for utilizing English in particular circumstances, and it mainly focuses on technical terminology. Then, the English course content, type of activities, and all the elements related to each lesson are the duty of the teacher to randomly select, organize and present them.

*1.2.9.4.3. Teaching material***.** Teaching materials, such as textbooks, multimedia means and audio-visual devices, have an important influence on the English learning process since they increase the students' motivation and concentration. Unfortunately, most the Algerian universities still rely on conventional methods and tools, such as the chalk, the board, and the handouts. Department of Civil Engineering and Hydraulics at Biskra University is not exempt from this fact. English teachers are dissatisfied with the lack of

English text books and printed syllabuses related to hydraulics specialism that could guide and permit them to enhance the language learning experience.

In addition to these problems, teaching English in Hydraulics division suffers from the lack of language teachers in general and ESP teachers in particular, which push the administration to dedicate English language module to subject teachers (instructor of technical specialty). The latter seem to continue focusing specifically on technical words, all the more ignoring grammar, language structure, and general vocabulary or even teaching General English as a springboard for teaching ESP. This is particularly so when the teacher is not a trained ESP teacher. It is unfortunate to mention that ESP instructors overlook integrating any of the aspects of that specific discipline.

Conclusion

During this chapter, it has been shown that ESP is a learner-centered approach since course design (goals, objectives, language content, teaching materials, teaching methodology, language skills … and so on) is based on the learners' needs analysis. Clear distinction between GE and ESP was provided in this chapter, in addition to the large space devoted to needs analysis because of the key role it plays in designing the ESP syllabus. The next chapter will describe the research design undertaken as well as the data collection tools employed in this research.

Chapter Two:

Research Methodology

Chapter II: Research Methodology

Introduction

In any given research, there are problems, which need to be solved, and hypothesizes that must to be accepted or rejected. Deciding on the adequate methodology to adopt should take into consideration various factors, such as research aims and questions, population nature, and sample size. The researchers' foresight is crucial in the determination of the particularities of various factors involved. Accordingly, the chapter portrayed the chosen methodology and the used research tools to collect the necessary data in addition to the reasons behind the specific selection.

2.1 Research Paradigm and Approaches

Generally, philosophical assumptions (paradigms) are a basic set of beliefs that guide any research. They serve as foundations for solving the research problem. Moreover, they also aim at narrowing the scope of the research through the research design, data collection tools, and data analysis techniques that deliver the appropriate responses to the research questions. The adopted methodology structure is provided by the entire strategy. In this context, Leavy (2017, p. 11) reported that the research practice is conducted following a number of beliefs that jointly constitute the research foundational philosophy, decide on topic until results demonstration and publication.

Despite the fact that there is much dispute concerning these philosophical assumptions or world views, the following are, the most frequently accepted paradigms in the literature: the positivist, interpretive or constructivist, critical or transformative, and pragmatic paradigm. Out of the number of paradigms, the pragmatist paradigm focus on the research problems and their nature and in order to solve them according to Creswell and Creswell (2018) "inquirers draw liberally from both quantitative and qualitative assumptions" (p. 48). That is, the pragmatist belief gives the freedom of choosing the appropriate method that answers the research questions. Accordingly, the pragmatist paradigm parallels with the research questions that revolve around the practical assessment of both the current ESP practices in the technical fields as well as the create ESP syllabus for the hydraulics field. Hence, a mixed-method would be the most appropriate working method for the research.

Following this reasoning, the qualitative approaching was used to the current ESP practices and the quantitative was used to measure Hydraulics students level in terms of ESP prerequisites and to assess the efficacy and comprehensiveness of the specifically design syllabus for the Hydraulics ESP course.

2.2 Research Design

Once again, the nature of the research problems and aims determines the design to be followed. The design is the more elaborative plan of action used to undertake the research. Since the one of the prime aims of the research is quantitative to the end of measuring students' level and assessing the efficacy of the designed course the quasi-experimental design was logical choice to be adopted.

2.2.1. Quasi-Experimental study. Among the most commonly resorted to designs in the educational context is the quasi-experimental design because it is considered the least flawed and the closest to real experimentation. From the number of quasi-experimental forms the study chose the pre-experimental design form: the one group pretest-post-test design that is commonly used to report on newly adopted methods or curriculum related developments (Cohen, Manion & Morrison, 2018, p. 406). Despite the existence of better quasi-experimental forms, this form was judged as the best fit for the present research because of the possible intervening validity issues. The basic concept of this design is summarized by Cohen et al (2018, p. 406-407) as the measuring of a dependent variable in a group by pretesting (O_1), exposer to timed experimental manipulation (X), post-testing (O_2), then the rationalization of the differences.

On this logic, the research experimented on the efficacy of the designed syllabus for the Hydraulics ESP course or the treatment (see appendices 05, 06, 07, and 08) through an analytical diagnostic pretest (see appendix 03) and an evaluative post-test (see appendix 09). The experimentation's end goal was the testing to finally reject or accept the advanced research null hypothesis.

2.3 Population and Sampling

2.3.1. Population. In research, the population represents the knowledge source. In educational research population is often predetermined following the variables to be tested or observed among other considerations. The present research population is the Hydraulics students at Biskra University. The first consideration in the choice of population is that Hydraulics is one of the technical fields where ESP course is assigned as transversal. The researcher is also conveniently a member at the Hydraulics department and the lecturer assigned for one the ESP course, which would allow the syllabus assessment and hypothesis testing. The Hydraulics division population is of one hundred and twenty students (N= 120). The phenomenon under investigation, which is the revised ESP syllabus, is assumed to certain extent to be well portrayed within the chosen population.

2.3.2. Sample. In research, the sample represents a subset of the superset, which is the population (O'leary, 2017, p. 379). Thus, a sample could be considered as a part of the population and holder of its characteristics. Practically speaking, performing any research on a whole population is challenging enough that is might be unfeasible most of the time. For that reason, sample research is the answer for the research workability. From the one hand, the sample selection for the present research was done in a random manner with equal selection chances, which indicates adopting probability sampling as the most suitable sampling strategy. On the other hand, the probability sampling follows a number of sampling methods out of which is the cluster sampling.

Creswell and Creswell (2018, p. 212) detailed cluster sampling as a multistage procedure that samples within individuals after clusters (levels) are first identified and then individuals' names are obtained. Because of the logical existence of levels or clusters within the Hydraulics population, the freshmen level students were randomly selected as one of the clusters. After framing both the level and the students names within the level a number as large as forty five (n= 45) students were randomly selected as sample to the present research. Creswell and Creswell also stated that the larger the sample is the accurate the inferences will be, which explains the considerable sample size the present research opted for.

2.4 Research Instruments Description

A number of instruments were utilized to collect data for the present research. The instruments were essentially to evaluate students' needs in the form of present and target situation analysis in terms of ESP prerequisites and requirements, which was realized through the instrument of questionnaire for both teachers and students. In addition to that is the testing of the efficacy of the specifically design syllabus for the Hydraulics ESP course, which was realized through the instruments of tests and treatment. The instruments are described as follows:

2.4.1. Teacher questionnaire description. The questionnaire was designed to the teachers who teach or taught ESP in technical field. Thirty teachers from three faculties, which are sciences and technology, natural sciences, computer sciences, and sciences of life faculty, and literature and foreign language faculty, participated in this study. The teachers' questionnaire was designed to collect data on the current ESP teaching practices and circumstances (see appendix 01). To that end, the questionnaire took semi-structured form in no more than three (03) pages. With a total of twenty three (23) items between the dichotomous, multiple choice and rank order items. The questionnaire conventionally started with profile information of gender, qualifications, specialism, and teaching experience.

Then, the questions detailed on the teaching circumstances as the hours, the class types and sizes, the attendance. After that, the questions detailed on the ESP courses in terms of teacher training, students' needs, skill development, language aspects focus, lecturer collaboration, teaching materials, syllabus, and use of translation in the ESP course. Moving then to students' assessment in relation to the ESP course and finishing with eliciting any additional information of interest judged as necessary.

2.4.2. Student questionnaire description. The student questionnaire was essentially a needs analysis of both the present and the target situations (see appendix 02). The questionnaire took the same semi-structure as the teacher questionnaire in no more than five (05) pages. The items were in a total of twenty five (25) that also ranged between the dichotomous, multiple choice and rank order. The questionnaire contained Arabic translation of each item in order to ease the understanding and ovoid the possibility not responding.

The question began with an ethnographic profiling section of five (05) items. The profiling involved gender, age, mother tongue, and importance and ease of learning the English language. The second section a present situation analysis with fourteen (14) items. The diagnostic questions involved the overall English learning experience from duration, acquired degrees, tutoring by natives. Additionally, questions on the importance of English in the subject area, domain of use, attendance, hours, allocated lesson time, learning time per week, English use in and out of class, language skills proficiency classification, language skills importance in the subject area. Then, moving to the teacher code switching in the class and an overall evaluation of the lesson on certain criteria.

The third and last section was a target situation analysis with five (05) items in total. The section started with the need for the English language in the subject area, with whom to be used, frequency of use, believed success factors within the subject arear, believed future needed genres and finishing with eliciting any additional information of interest.

2.4.3. Treatment description. The treatment was carried out with first year Licence Students of Hydraulics (National division) at M.K. University of Biskra during the first semester of academic year 2022/2023. According to the canvas, L1 students of hydraulics have only one session for foreign language (French) per week in the form of a lecture. In order to conduct the planned treatment, the researcher solicited the administration to change the language from French to English and to add another session for the English module because teaching one-hour and half weekly remains insufficient to cover every point of the predesigned syllabus.

The researcher herself taught the planned treatment since she is a full-time teacher in the department and at the same time master two student in the English language department. The predesigned syllabus contained four lessons, each one comprised preliminary section comprehending the outcomes, the grammatical and the lexical items, and two main sections. The first section covered three short interrelated dialogues, whereas the second section encompassed reading comprehension texts and their related questions (see appendix 05, 06, 07, and 08). The texts were extracted from technical published books or article, or from the web. The reading comprehension texts were divided into four sub-sections, which were comprehension, text exploration, close test, and paragraph writing. The comprehension sub-section comprised global and detailed comprehension (multi-choices questions, and thinking question) related to the text. However, the text exploration includes synonyms, antonyms and grammar questions. The close test concerns fill in the gaps while paragraph writing is about jumbled sentences. The dialogues were integrated to the treatment for the purpose of attracting the students' attention in order to increase their motivation because reading a text and answering the related questions appeared to be so monotone. The theme of dialogues was about two teachers from U.S.A who were invited to assist the International Conference on Water Management in Arid Zones. The journey of the American teachers in Biskra city and Biskra University was described during the four lessons, and various local cultural insights were integrated.

The treatment sessions were scheduled on Monday afternoon (the first session) and Thursday morning (third session). The students' attendance was acceptable especially on Monday, and they were highly involved and motivated when they performed the role-playing of the dialogues. Concerning the lesson presentation, the teacher used data show to portray the lesson. Then, she read the dialogue for several times and explained it in English then in Arabic. After that, she asked the students to accomplish the dialogue. Generally, the dialogues explanation and their role-play took the entire session. In the same manner, the teacher read the text three times and asked the learners to read it silently. Furthermore, she explained the passage in English, especially the technical vocabulary. After that, she asked the audience to answer the questions.

2.4.4. Test description (Pre/Post). Tests are considered a crucial tool to observe, examine, and evaluate subjects' progress. They are practical because they provide tangible measurable data that ultimately allow the researcher to accept or reject the null hypothesis through inferential statistics. Tests also precisely depict the similarities or the differences between independent samples or related testers.

2.4.4.1. Pre-test description. It is also called diagnostic test, it is crucial stage in sample treatment. Pretest describes the students' current proficiency in language skills, grammar, and other language-related abilities. The designed pretest looked like English language baccalaureate examination of scientific specialty. It comprised the same sections as in baccalaureate model, whereas the reading comprehension text was somehow related to hydraulics with some semi-technical words. The reading comprehension text was divided into four sections, which were comprehension, text exploration, close test, and paragraph writing. The comprehension section involved global and detailed comprehension (multi-choices questions, and thinking question) related to the text. However, the text exploration includes synonyms, antonyms, and grammar as well as phonology questions. The close test concerned the fill in the gaps while paragraph writing was about ordering the jumbled sentences to make a coherent passage. Concerning the scoring of the pretest, comprehension section was scored out of seven points (07), text exploration out of five (05), close test out of three (03), and paragraph writing out of five points (05) (see appendix 03).

2.4.4.2. Post-test description. The final stage following any treatment is post-testing. The post-test is considered an attainment test because it measured how well the students had accomplished the mentioned test, and answered the following question did the planned treatment attain its goals, and in which manner? The post-test model was similar to the pretest one with two main differences. The phonology questions were replaced by grammar items concerning asking auxiliary and Wh questions since the students were trained and familiarized with this type of activities during the whole semester, and the reading comprehension text was a technical text related to hydraulics. The scoring was changed particularly for comprehension section and text exploration, it became out of six points (06) for both sections (see appendix 09).

2.5 Procedures

2.5.1. Questionnaire piloting. One of the highly recommended research procedures is instrument piloting. The piloting highlights any pitfalls that could be avoided when conducting the actual experimental work. The piloting is no arbitrary procedure but an essential one to guarantee the validity and reliability of the instrument, thus, guarantee the validity and reliability of the research as a whole. Accordingly the present research opted for the piloting its instruments.

2.5.1.1. Piloting the teacher questionnaire. The teacher questionnaire piloting following the conventional piloting stages. The start was with the piloting of the item pool

that was done with the supervisor and fellow classmates, which resulted in a number of exclusions, modification, and reformulations. Then, the final piloting stage where the modified version was distributed to the target teachers. To facilitate the procedure the questionnaire was administered through google forums. Because it was just not possible to identify every teacher that ever taught ESP, The targeted teacher sample was considerably large. Yet only those who taught ESP responded with a total of twenty eight (28) respondents, which could be considered as acceptable, especially statistically.

The piloting feedback did not highlight anything of direct relation to the issue treated by the questionnaire. Thus, no modifications where performed and questionnaire was kept as it was initially designed.

2.5.1.2. Piloting the student questionnaire. The same as the teacher questionnaire, the student questionnaire was piloted following the same stages. The item pool was piloted then was the final piloting with the target student sample. Because, group administration was then it was adopted. Despite targeting a considerably large sample the responses were relatively small in number with a total of thirty (30) respondents, which would be satisfactory, especially statistically. Feedback from piloting did not highlight any issue for that the questionnaire kept its initial design.

One of the highly recommended research procedures is instrument piloting. The piloting highlights any pitfalls that could be avoided when conducting the actual experimental work. The piloting is no arbitrary procedure but an essential one to guarantee the validity and reliability of the instrument, thus, guarantee the validity and reliability of the research as a whole. Accordingly the present research opted for the piloting its instruments.

2.5.2. Questionnaire evaluation. Another highly recommended procedure is the instruments evaluation. Instruments evaluation is also no arbitrary procedure but to ensure both validity as well as reliability of the research instrument, which also insures the validity and reliability of the collected data. Deciding on both validity and reliability can be of two types professional and statistical. Cohen, Manion and Morrison (2007) defined the two concept respectively as “The validity of a measurement instrument is the extent to which the instrument measures what it is intended to measure” and “reliability is the consistency with which a measurement instrument yields a certain, consistent result when the entity being measured hasn’t changed” (p. 114). In other words, instrument validity can be said to be the measuring of that which is presumed to measure and performing as well it is supposed to

perform. However, reliability ca be said to be the consistent production of nearly the same result over changing time periods.

On this rationale and from the number of forms of both validity and reliability, the research opted for face and content validity, which was judged us satisfactory by the supervisor. For the reliability, the research opted for validity as internal consistency, which was judged statistically.

2.5.2.1. Teacher questionnaire reliability testing. Instrument internal consistency tests whether or not the items within an instrument give similar results each time. In the educational context, statistical reliability is usually performed through the Cronbach alpha. The collected data from the piloting stage were the basis of the reliability calculations, from the one hand. From the other hand is the use of SPSS for calculations performance. On that grounds and using the questionnaire piloting results, the teacher questionnaire reliability was computed.

Table 2

Teacher questionnaire reliability testing

Number of variables	Cronbach Alpha Coefficient
36	0.586

The table (02) shows the results of the teacher questionnaire reliability testing. With a scale of thirty six (36) variables, the Cronbach alpha gave a value of 0.586, which is just at what it is conventionally considered the threshold of the reliability coefficient at 0.60 (Dőrnyei, 2003, p. 112). Thus, the value denotes enough reliability to consider the scale variables as internally consistent.

2.5.2.2. Student questionnaire reliability with Cronbach alpha coefficient. Computation of student questionnaire reliability coefficient followed the same procedure as the teacher questionnaire. The results were as follows:

Table 3

Student questionnaire reliability testing

Number of variables	Cronbach Alpha Coefficient
54	0.599

The table 03 demonstrates the results of the student questionnaire reliability testing. In a scale of fifty four (54) variable the Cronbach alpha gave a value of 0.599, which just at the conventional reliability coefficient threshold at 0.60. Therefore, the value indicates sufficient internal consistency, thus, variables reliability within the scale or student questionnaire.

Conclusion

A detailed summary of the chosen research methodology was given in the previous chapter. The chapter included the theoretical visions as well as the practical procedures that was adopted to collect the data. The theoretical and practical ensemble was described in order to elucidate the research methodological framework, hence, gave a clear conceptual idea to the research from start to finish.

Chapter Three:

Data Analysis, Results Discussion & General Conclusion

Chapter III: Data Analysis, Results Discussion, and General Conclusion

Introduction

The coming chapter is analyzing, interpretive, discursive of the results obtained from the instruments described in the previous chapter, and finally conclusive. Analysis and interpretations took a descriptive and inferential approaching. The findings are then discussed with reference to the research questions and hypotheses. The last step was the conclusion of the research as a whole.

3.1 Data Analysis

The data analysis was mainly performed quantitatively because the data were also mainly quantitative. The quantitative analysis and interpretation gave meaning to the collected data, hypothesis testing, and determined conclusions. The analysis was done statistically through descriptive and inferential statistics.

3.1.1. Descriptive statistics. As a start, descriptive statistics was used to summarize and organize the data in order to show the relationships among the different variables and component. The description involved both teachers and students' questionnaires; in addition to, the pretest and posttest data.

3.1.1.1. Teacher questionnaire. The questionnaire was designed for teachers who taught or are teaching technical English as a subject or English as a course in the technical fields. Comprised of twenty six (26) question, it covered personal information, teaching experience, teaching means, teaching skills and so on.

1: Teachers' gender

Table 4

Teachers' gender distribution

Gender	Participants	Percentage
Male	19	63,3%
Female	11	36,7%
Total	30	100%

The above table (table 4) portrays teachers' gender distribution in which more than half of the sample (63, 3%) are male and less than 40% are female. This could be explained by the fact that technology fields have traditionally been a male targeted discipline;

nevertheless, female teachers have recently begun to pursue the field due to the professional opportunities it provides in the work market.

2: Qualifications

Table 5

Teacher qualifications

Qualifications	Participants	Percentage
Master (LMD)	1	3,3%
Magister	4	13,3%
Doctorate	25	83,3%
Total	30	100%

As shown in table 5, the majority of the teachers are doctors (83, 3%), four teachers have the magister degree and just one participant has the Master degree. The degree of the teacher and mastering the English language are interconnected since having the doctorate degree requires publishing articles in English.

3: Teacher specialism

Table 6

Teacher specialism distribution

Specialism	Participants	Percentage
Applied linguistics	6	20%
Foreign Language teaching	1	3,3%
Literature	2	6,7%
American Civilisation	1	3,3%
Language and civilisation	1	3,3%
Architecture	5	16,7%
Electronics	3	10%
Mechanics	1	3,3%
Civil engineering	1	3,3%
Hydraulics	2	6,7%
Computer sciences	5	16,7%
Mathematics	2	6,7%
Total	30	100%

The descriptive in table 6 illustrates teachers' specialism distribution in which it can be noted the diversity of the teaching area. Out of 30, 11 teachers (36, 6%) represent English language discipline; whereas, Architecture and Computer sciences are equally depicted with 16, 7%. Other specialisms are also represented such as Electronics, Hydraulics, Civil engineering, Mathematics, and Mechanics

4: Teacher status

Table 7

Teacher status

Status	Participants	Percentage
Full-time teacher	30	100%
Part-time teacher	0	0%
Total	30	100%

The obtained data displayed in table 7 show that all the participants are full-time teachers. The overall observation is that a full-time teacher is more conscious and aware of the kind of responsibilities involved with the teaching position than the temporary teacher.

5: Teaching experience

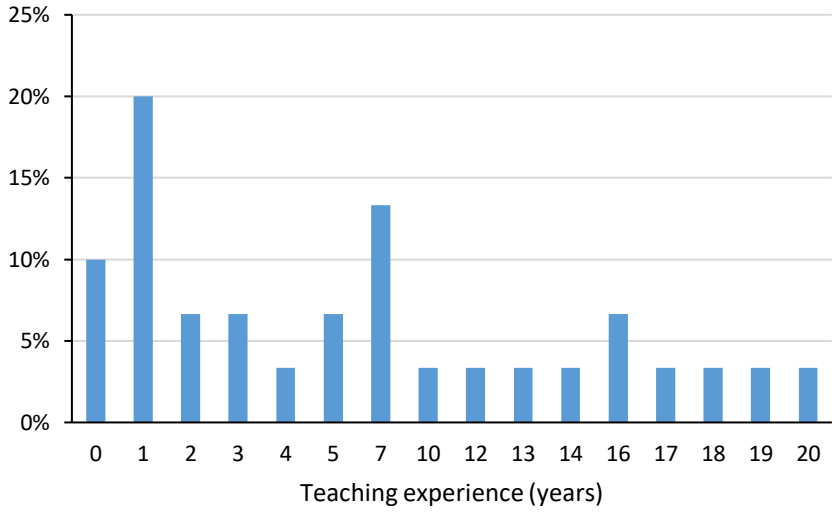

Figure 3. Teaching experience

The figure (3) summarizes the participants' overall teaching experience. Instructors' teaching experience is a crucial factor to the success of the English language learning. Thus, the participants were requested to indicate for how long they have been teaching the language. The findings show that the teaching experience varies from 0 years (novice

teachers) to 20 years, and the percentages fluctuate between 3, 3% and 20%. The observation is that the experience varied and long enough to give interesting and relevant insights into the ESP teaching.

6: Teaching levels

Table 8

Teaching levels

Levels taught	Participants	Percentage
First year students	15	30,6%
Second year students	11	22,4%
Third year students	5	10,2%
Master one students	18	36,7%
Total	49	100%

This question is asked in order to identify at which level English is introduced in the technical fields as well as the various levels the teachers deal with. As shown in table 8, English is taught from the first-year licence (30, 6%) to master one with a higher percentage (36, 7%). From the exposed data, one can deduce that in most departments English is studied in first year licence to master one.

7: Weekly teaching hours

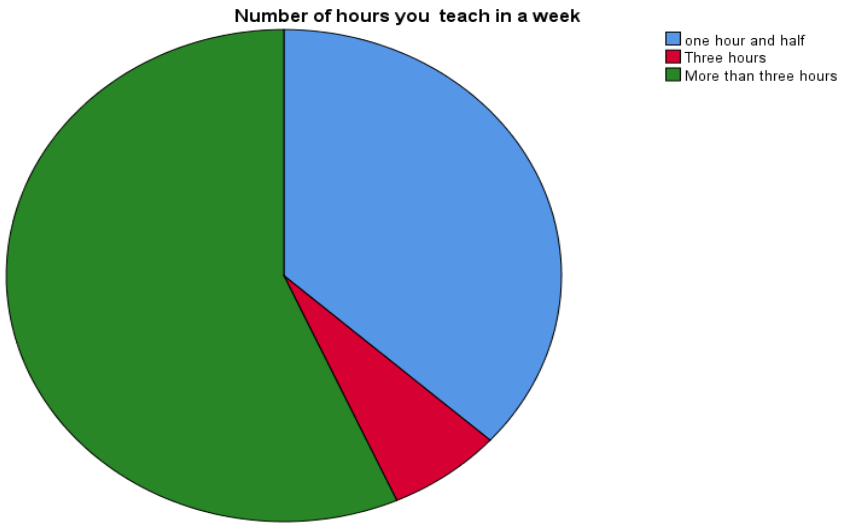

Figure 4. Number of hours taught weekly

The findings related to the number of hours the teacher participants teach per week are portrayed on figure 4. As appears in the figure, the majority of respondents teach more than

three hours (56, 7%) followed by one and half hours (36, 7%) weekly, whereas only two teachers state that they teach three hours per week (6,6%).

8: Type of English class

Concerning the type of class, from the descriptive data described in table 9, it appears that the obtained results are approximately equally distributed between those who teach large classes and those who do not teach this type of class. As known, the size of class plays an important role in students' understanding and, consequently, knowledge acquisition.

Table 9

Type of class

Responses	Participants	Percentage
Yes	17	56,7%
No	13	43,3%
Total	30	100%

9: Student attendance in English classes

Table 10 summarizes the findings related to the students' attendance in the English class. From the former, it appears that 80% of the teachers think the attendance of their students is acceptable or somewhat acceptable. Even though the English class has the form of lecture in which attending is not compulsory, this behavior explains students' motivation and their positive attitude towards English.

Table 10

Student attendance in English class

Students' attendance	Participants	Percentage
Acceptable	10	33,3%
Somewhat acceptable	14	46,7%
Not acceptable	6	20%
Total	30	100%

10: English class Form

Concerning the form of English class, the obtained results portrayed in table 11 indicate that more than the half the teachers (56, 7%) present their English courses in the form of lectures and tutorial sessions. In contrast, lectures option scored 23,3%, and tutorial sessions recorded 20%. In order to well understand and assimilate the language course, the English lecture needs to be followed by tutorial session (TD) where a set of activities such as grammar exercises, reading texts aloud, and speaking practice, are performed, which is not the case in most of technical fields. The reality is that English is taught as lecture in no more than one session each week.

Table 11

English class form

Class form	Participants	Percentage
Lectures	7	23,3%
Tutorial session	6	20%
Both	17	56,7%
Total	30	100%

11: English course characteristics

The results reported on figure 5 demonstrate English class characteristics distribution, in which half of the participants taught English as ESP and 40% in the form of general English. Teaching General English instead of technical English does not help the students in their current or further studies. Conversely, this practice may curb their success due to the unnecessary grammar structures and needless wide general vocabulary diction.

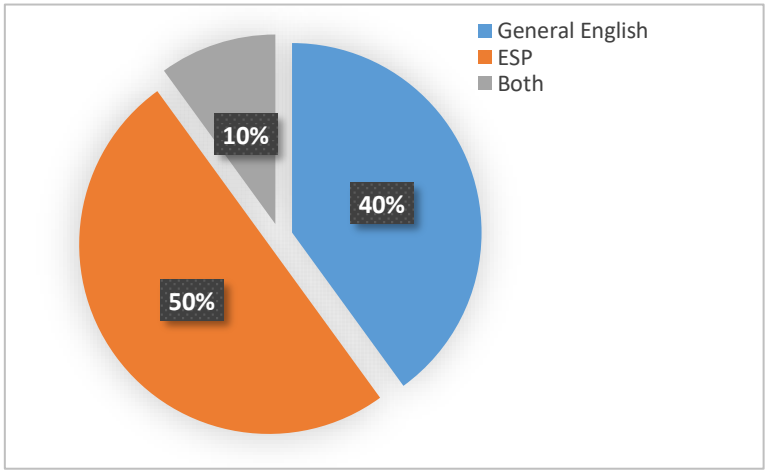

Figure 5. English course characteristics

12: Teacher ESP training

When asking the participants if they have done any training in ESP teaching, most of them (80%) answered negatively, only six teachers have had training in ESP courses (table 12). This may suggest that most of teachers do face difficulties to choose the appropriate content to teach or the suitable means to use especially when there is no syllabus to follow.

Table 12

Teacher ESP training

Responses	Participants	Percentage
Yes	6	20%
No	24	80%
Total	30	100%

13: English leaning necessity in the technical fields

Table 13 depicts the responses of teachers to the following question: Do you think it is necessary for students in technical fields to learn English? If yes, what are the reasons? Concerning the first part of the question, the majority of the teachers (93,3%) agreed that learning English is highly needed for students in technical fields. The second part of the question concerns the reasons that urge technical students to learn English. Recently, English has become a requirement in order to study or work overseas, to publish articles in highly classified journals, to have access to a wider library of books and research, and to new technologies. Simply put, English became the first lingua franca across the world.

Table 13

English leaning necessity in the technical fields

Reponses	Participants	Percentage
Yes	28	93,3%
No	2	6,7%
Total	30	100%

14: Student need for English

The findings related to students' purposes behind learning English are displayed in table 14. From the latter, it appears that teachers' responses are approximately equally distributed between the proposed items since they are all interrelated. For instance, before

writing reports or publications in English, the students should read some articles or books and understand them. English is also needed to participate in oral English discussions inside the classroom or in conferences.

Table 14

Student need for English

Students' purposes to learn English	Participants	Percentage
Understand scientific lectures in English	24	24%
Participate in oral English discussions	23	23%
Read scientific textbooks in English	25	25%
Write scientific reports or publications in English	28	28%
Total	100	100%

15: Skills teachers emphasize when teaching technical students

In order to identify the skills on which the instructors emphasize more when delivering the course, the participants are requested to classify those skills by means of importance. The gathered data described in figure 6 show that the top three language areas the respondents think to be the most important are reading, writing and speaking with 56,7%,43,3%, and 40%, respectively. However, they claim that the important language skills are ranked as follow writing (36,7%), speaking (33,3%), listening (33,3%), and reading (13,3%). The surveyed teachers argue that the speaking skill is the least important one (20%).

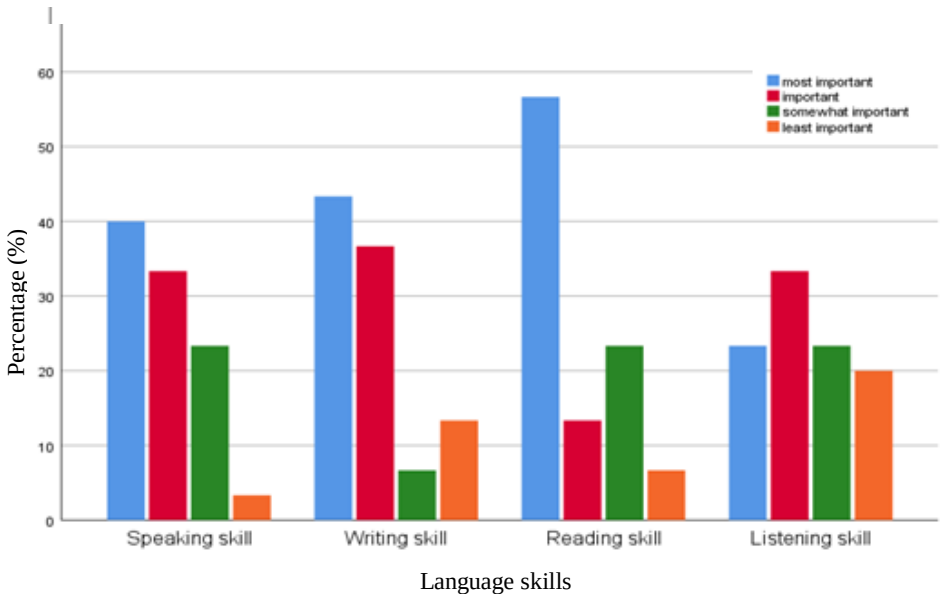

Figure 6. Language skills on which teachers emphasize

16: Teaching tendency

Table 15 displays the results related to the teaching tendencies on language aspects, in which the second option "grammatical structures related to technical field" scored the highest percentage (35,2%). However, the third and the fourth option are approximately equally distributed with 25,9% and 24,1%, respectively. Moreover, it seems that the least focused on is the first option "General grammar notions" with 14,8%.

The obtained data may be explained by the fact that the language structures needed for any scientific area are the same; the differences are the result of the communicative situations as Hutchinson and Waters argue (1987, p. 165):

> In terms of language content, there is little reason why, say, a Biology text should be more useful to a biologist than, say, a Physics text. There is not grammatical structure, function or discourse structure that can be identified specifically with Biology or any particular subject. Such things are the product of the communicative situation (lecture, conversation, experiment, instructions, etc.) and the level (engineer, technician, manager, mechanic, university etc).

Table 15

Teaching tendency

Teaching tendency	Participants	Percentage
General grammar notions	8	14,8%
Grammatical structures related to technical field	19	35,2%
Lexical items related to general English	14	25,9%
Lexical items related to general technical English	13	24,1%
Total	54	100,0%

17: Collaboration with the subject lecturers

As seen in table 16, the findings related to if there is any collaboration between teachers of the technical fields and the language fields, seem to be equally distributed (50% answered yes and 50% reported no). The results mean that the participants are aware of the important role that subject teacher plays in ESP course as Kennedy and Bolitho claimed

(1984: 13): "A further aspect concerns the role of the subject teachers, since any decision to use an ESP approach relating to a specific subject will inevitably demand some degree of co-operation between language teachers and subject specialists."

Table 16

Cooperation with the subject teachers

Responses	Participants	Percentage
Yes	15	50%
No	15	50%
Total	30	100%

18: Instruction material

Figure 7 demonstrates the collected data related to the type of teaching material employed by the teacher participants. From the former, it appears that approximately half of the surveyed teachers rely on their own prepared material (46%). The respondents who reported that they utilize textbooks, specifically those related to technical English or documentation used by students in their own field of study, are estimated to be 28% and 20%, respectively. In contrast, textbooks related to general English scored the lowest percentage (6%). Generally, when an appropriate resource is unavailable, the EPS teacher needs to select, adopt, adapt, or sometimes design their own, as Kennedy and Bolitho (1984) assert: "From the plethora of published materials now available, he might be expected to select and adapt learning materials for a class. He must be thoroughly familiar with a wide range of ESP materials, both courses and supplementary materials" (p. 138). The authors add that "he might find no materials suitable or adaptable to the needs of a particular class and, consequently, will have to select and exploit suitable texts, and to write suitable exercises" (p. 138).

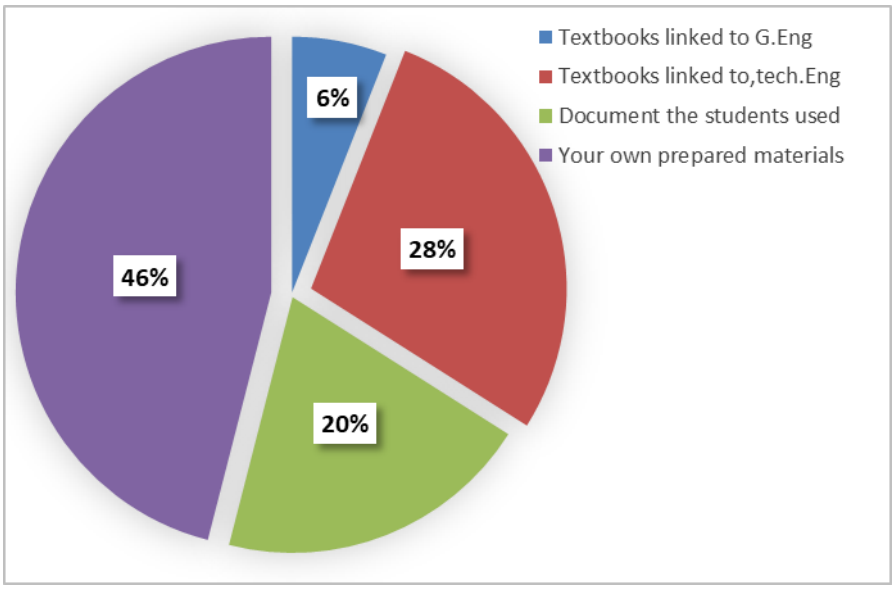

Figure 7. Instruction material distribution

19: The existence of syllabus for technical English

The table 17 displays the participants' responses to the following question: Is there any syllabus for technical English do you rely on? If no, what do you do? Explain. What can be observed is that more than half of the teachers report the existence of a program for technical English, whereas 43,3% affirm that there is no syllabus. Concerning the second part of the question, the majority of the participants claim that they design their own syllabus according to the students' needs. Others assume that they adapt the existing program based on students' objectives; however, some of them simply translate his course from French into English. In this context, Kennedy and Bolitho (1984) argue that: "ESP programs are often the indirect result of political decisions made at governmental level about the role of English within the country in which the learner is studying. These decisions may restrict or widen the role, and hence the use, of English within the community" (p. 11).

Table 17

The existence of syllabus for technical English distribution

Responses	Participants	Percentage
Yes	13	43,3%
No	17	56,7%
Total	30	100%

20. The use of translation to French or Arabic when teaching

When the participants were asked if they used translation to French or Arabic, the great majority (83, 3%) reported translating to their mother tongue or first language (table 18). In contrast, just five teachers reported explaining the course only in English. The respondents, who disclosed the use of translation in their English course, were requested to specify the reasons behind this behavior. A number of them argued that they translate to clarify some notions and explain difficult vocabulary or concepts for the purpose of facilitating the understanding and enhancing the comprehension.

Despite the fact that translation is a conventional teaching method, its application is questioned in numerous occasions. Nonetheless, researchers agree that it might be advantageous in the early stages of learning EFL/ESL. In this context, Kennedy and Bolitho (1984) said that: "Many of the techniques traditionally used in ELT work can be exploited in ESP vocabulary teaching especially at the early stages when both subject and linguistic content are at an elementary level" (p. 59) Among these methods, they mention translation: "...translation may be preferred if the teacher is competent in the student's language as well as English." Concerning the debatable use of translation methods in the classroom, Y. Zhao (2015) deduced, "the final findings revealed that, while translation can make teaching and/or learning English easier, both English teachers and learners should limit the use of translation in and out of ESL classrooms".

Table 18

The use of translation is English course

Responses	Participants	Percentage
Yes	25	83,3%
No	5	16,7%
Total	30	100%

21. Technical students interest in learning English

Table 19 portrays the teachers' responses to the question how much do you think technical students are interested in learning English? It appears that more than half of the participants (53,3%) reported that most of the students are attracted to studying English,

whereas some them scored 30%, and few of them scored 16,7%. These statistics may be explained by the fact that technical students are aware of their need to learn English language for article publication, further studies overseas, or for promising job opportunities.

Table 19

Technical students' interest in learning English

Responses	Participants	Percentage
Most of them	16	53,3%
Some of them	9	30%
Few of them	5	16,7%
Total	30	100%

22: Students' assessment

Assessment is a crucial process in language learning because it helps in the evaluation of the students' progress, teachers' teaching methodology effectiveness, and learners' achievement. The obtained results show that the majority of the participants assess their students through both written and oral tests (53,3%) or written tests only (43,3%). Just one instructor evaluates his students using oral tests. In fact, the teachers need to vary the types of the test in order to identify the students' proficiency in different skills from various sides.

3.1.1.2. Student questionnaire. The student questionnaire was designed to analyze the students' needs with respect to the ESP course. The questionnaire involved a total of twenty five (25) items that covered personal information as well as their present and target situations. Just as the teacher questionnaire the questions were analyzed and interpreted either dependently or independently depending on their relation.

3.1.1.2.1. Personal information section. The section concerns student's personal information of five (05) items covering gender, age, mother tongue, and students' attitudes towards the English language.

1: Students' gender

Table 20

Students' gender distribution

Gender	Participants	Percentage
Male	16	50%
Female	16	50%
Total	32	100%

Table 20 demonstrates that students' gender is equally distributed, with 50% for males and 50% for females. Although the fields of technology have long been male-dominated domains, female students have recently become more interested in them, especially hydraulics, because of the job opportunities it provides.

2: Students' age

Figure 8 depicts students' age distribution, in which participants' age varies from 18 to 21 years, with 43, 8% and 31,3% for 18 and 19 years respectively. A fact that suggests their homogeneity and shared learning experience.

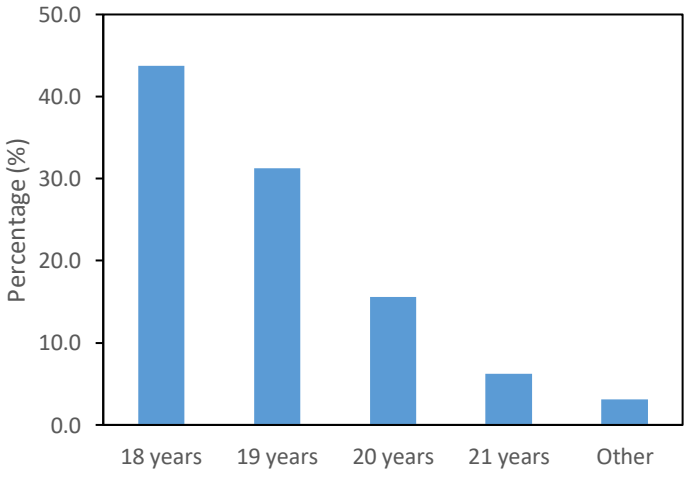

Figure 8. Students' age distribution

3: Students' mother tongue

In order to identify the status of English as a second or foreign language, the hydraulics L1 students were asked what their mother tongue is. Twenty-eight students answered that their mother tongue is Arabic, whereas just four participants stated that Berber

is their first language (table 21). The obtained results explain that English is considered a foreign language for all the members of the studied sample.

Table 21

Students' mother tongue

Mother tongue	Participants	Percentage
Arabic	28	87,5%
Berbère	4	12,5%
French	0	0%
Others	0	0%
Total	32	100%

4: Students' attitudes towards English.

Students' personal attitudes towards English is described through item 4 and item 5. The former asked students how you consider learning English important, somewhat important or unimportant. However, item 5 is about if learning English is easy, intermediate or difficult.

Figure 9 and table 22 portray students' overall personal attitudes towards English. The totality of the students stated that English course is important or somewhat important (figure 7), with 81,2% and 18,8 respectively . Moreover, 50% of the participants think that learning English is easy, 37,3% of respondents believe that is intermediate, and only 12,5% think that learning English is difficult. This may imply that English is vital for their studies and their motivation to learn it remains high.

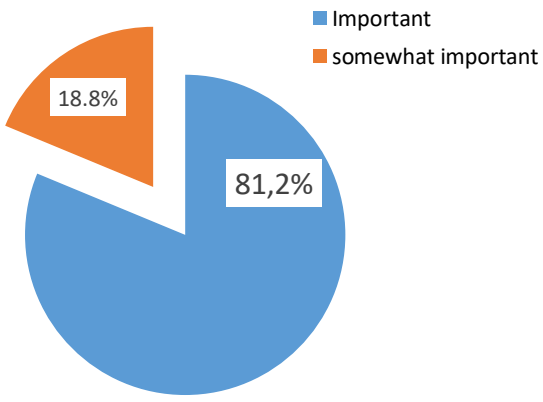

Figure 9. Students' attitude towards English language

Table 22

Students' attitude towards English learning

	Participants	Percentage
Easy	16	50%
Difficult	4	12,5%
Intermediate	12	37,5%
Total	32	100%

3.1.1.2.2. Present situation analysis. The Present situation analysis section represents the main part in needs analysis and comprises fourteen questions. It seeks students' experience in English learning, their degree, their current language proficiency, the skills they perform best, course schedule, course duration as well as the importance of English in their area of study.

6: Students' English learning duration

In this item, students were asked how long you have been studying English. The obtained results reported on figure 10, indicate that the majority of the participants have been learning English for 7 or 8 years with 43, 8% and 46,9% respectively. This may suggest that almost half of the students have already been exposed long enough to the basic knowledge of English language whether in receptive skills or productive skills.

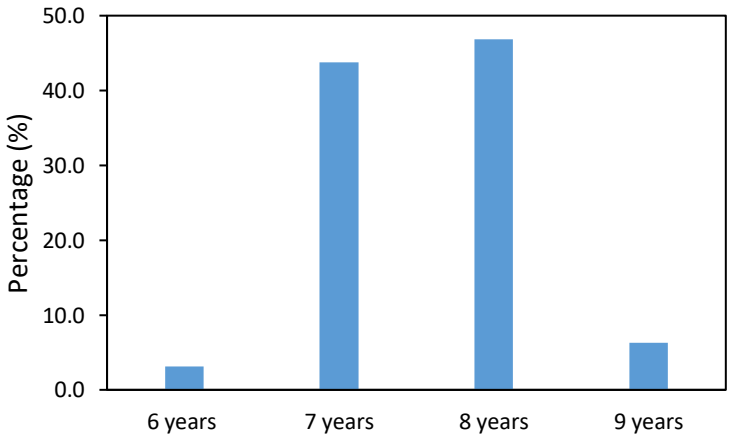

Figure 10. Students' English learning duration

7: Students English degree

This question was asked in order to identify if there are students who have studied English out of public schools (in private school or online). As seen in table 23, just four participants have obtained degrees in English language A2 and B1 level certificates. One student did not indicate the type of degree and the last one did not remember. The acquired results demonstrate that the majority of the respondents relied only on public schools for their English studies.

Table 23

Students' degree in learning English

Students' degree	Participants	Percentage
Yes	4	12,5%
No	28	87,5%
Total	32	100,0

8: Students' tutoring by an English native teacher

Table 24 portrays the responses of students about receiving any tutoring by an English native teacher. From 32 participants, 30 members have not been tutored by a native teacher, which means that they have studied English as a foreign language relaying on Algerian syllabi designed by the Ministery of education. Only 2 reported that they have receive tutoring by a native teacher, one for 2 years, and the second did not mention the duration.

Table 24

Students' tutoring by English native teacher

Students' tutoring	Participants	Percentage
Yes	2	6,3%
No	30	93,8%
Total	32	100%

9: English importance to the students' area of study

This question was asked to identify if the students are aware of the importance of English in the area of their study or not. 28 participants from 32, which represent 87,5%, answered yes; however, only 4 students said no. The obtained results in table 25 picture the high awareness level of students of the position that English language hold in their field of the study since the most published articles, and the new technologic facilities are in English.

Table 25

Importance of English to the students' area of study

English importance	Participants	Percentage
Yes	28	87,5%
No	4	12,5%

10: English use in students' study

When they are asked if they use English in their study, 24 from 32 participants reported that they do use English, and most of them stated that they use English for speaking and writing (18), whereas 5 of them argued they use English for writing only, and just one assumed to use English for speaking only (table 26).

Table 26

English use in students' study and the frequent used skill

English use	Participants	Percentage	Speaking	Participants	Percentage
Yes	24	75%	Yes	1	4,16%
No	8	25%	No	23	95,84%
Total	32	100%	Total	24	100%
Writing	Participants	Percentage	Doing both	Participants	Percentage
Yes	5	20,84%	Yes	18	75%
No	19	79,16%	No	6	25%
Total	24	100%	Total	24	100%

11: Students' English class attendance

The finding related to the students' English class attendance are represented on figure 11. Although, the presence of students in the course is non-compulsory, it appears that the

frequency of students' attending varies from always (28.1%), usually (34,4%), and sometimes (21,9%), which may be considered as acceptable attendance rate. Just one student never attended English class, and only 4 students rarely attend.

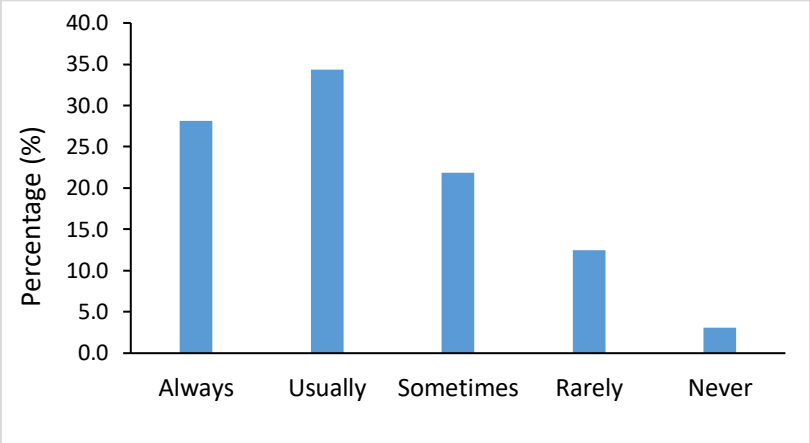

Figure 11. Students' English class attendance

12: Time allotted to English class

As shown in the table 27, there is no agreement on the allotted time to the English class. 34,4% of students reported that they learn English one hour a week, 31,3% stated that the allotted time to English class is one hour and half, 12,5% say that they study English 3 hours weekly, and so on. The overall observation reveals students' unawareness about the duration of English course per week. The allotted time to the English class in the official syllabus is one session of one hour and half for all groups as a lecture. As exception, this year during the first semester, the administration allotted two sessions for Hydraulic L1 students in the form of a lecture.

Table 27

Time allotted to English class

Allotted time	Participants	Percentage
1,0	11	34,4%
1,5	10	31,3%
2,0	4	12,5%
3,0	4	12,5%
4,0	2	6,2%
5,0	1	3,1%
Total	32	100%

13: Sufficiency of allotted time

According to the results described in the table 28, it appears that the quasi majority of participants (81,2%) believe that the current allocated time is insufficient., whereas about 18,8% of the sample find it enough. Unsatisfied students about the allotted time for English class express diverse points of view about the adequate number of sessions to be adopted. 34.62% think that the time should be doubled, and 26,9% propose 3 sessions weekly. Moreover, 38,46% favored an amount of 4 sessions weekly for the purpose of covering several aspects of foreign language, including subskills strongly related to the field of study. Indeed, the factor of time may constitute a constraining factor for the success of English learning achievement.

Table 28

Sufficiency of allotted time

Allotted time	Participants	Percentage	3 hours	Participants	Percentage
Yes	6	18,75%	Yes	9	34.62%
No	26	81,25%	No	17	65,38%
Total	32	100%	Total	26	100%
4.5 hours	Participants	Percentage	6 hours	Participants	Percentage
Yes	7	26,9%	Yes	10	38,46%
No	19	73,1%	No	16	61,54%
Total	26	100%	Total	26	100%

14: In which class English is used

As seen in table 29, English is more used in English classes only (53,1%) rather than in area of study (18,8%) or in both cases (28,1%). Because of the dominance of French in the fields of technology being the language of instruction, English is still limitedly used.

Table 29

English use according to the type of class

English use	Participants	Percentage
English classes Only	17	53,1%
Area of study	6	18,8%
Both classes	9	28,1%
Total	32	100%

15: Students' current English proficiency

Figure 12 reported the students' current proficiency according to the English skills. It appears that hydraulics students present an acceptable English ability in various skills (speaking (43,8%), reading (50%), and writing (40,6%)). However, the language skills in which the participants face difficulties (weak level) are grammar (37,5%), pronunciation (34,4%), and listening (25%). The students' good level is observed only in listening skill (50%). As known, the most studied English skills from the middle school to the university are speaking, reading, and writing. Although, grammar is also widely studied explicitly or implicitly in writing or reading skills, hydraulics L1 students still struggle with it due to the considerable amount of structures and rules that need to be studied.

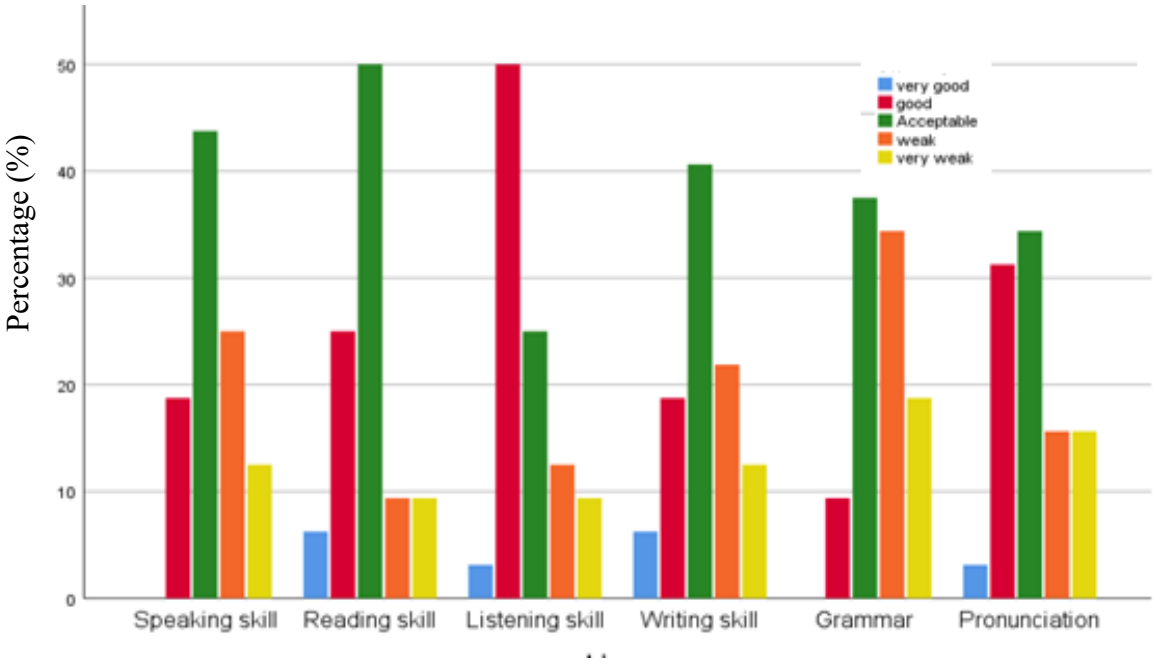

Figure 12. Students' current proficiency according to the English skills

16: English skills importance to the students' specialism

The classification of English skills according to their importance to hydraulics is displayed in figure 13. What can be noted is that numerous skills seem to be very important to the students major. For instance, technical vocabulary, speaking, pronunciation, writing, general vocabulary, are ranked first, second, third, fourth, and fifth respectively. Reading, listening and grammar stated to be the least important skills in English for hydraulics major. The obtained results may be explained by the high awareness of students in terms of the importance of technical vocabulary, speaking and writing in their present and future academic studies. The productive skills encourage the communicative skill in order to be more involved inside or outside the classroom.

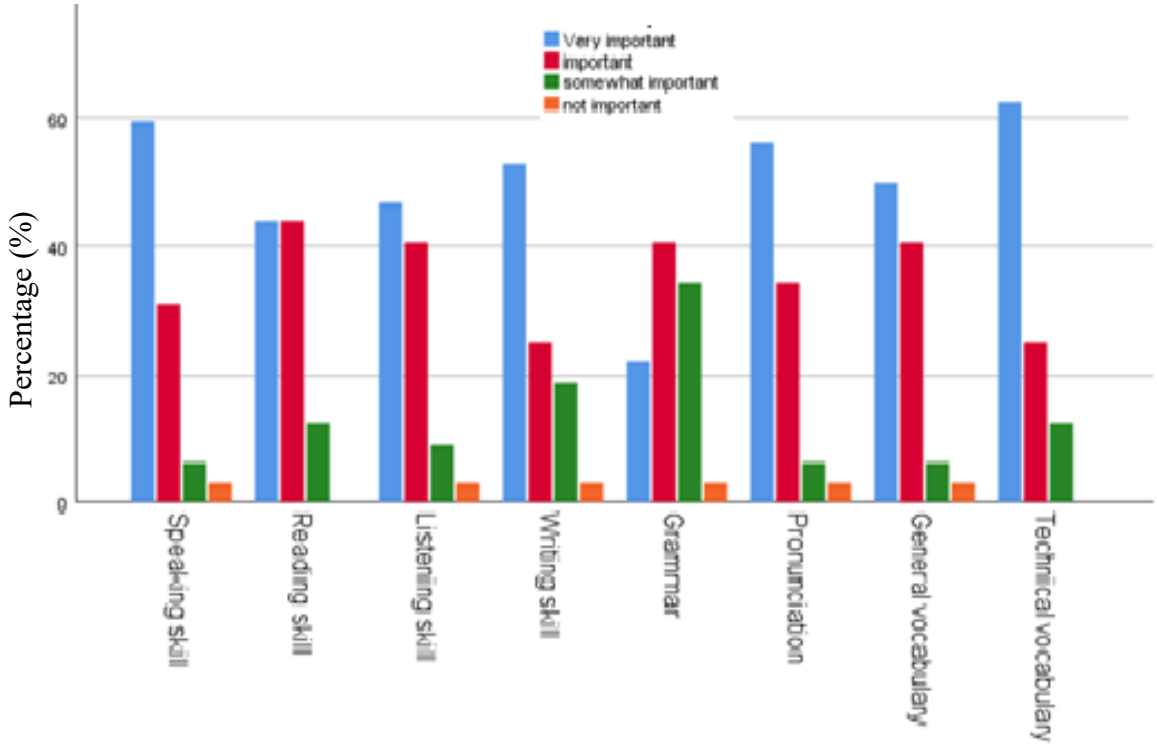

Figure 13. English skills importance to the field of study

17: Medium of English lesson explanation

When asking students how your teacher explains the English lesson, from 32, 21 participants (65,6%) reported that the instructor explains the course in English, Arabic and sometimes in French to clarify any ambiguity (table 30). 28,1% stated the usage of the mother tongue and the second language by the teacher to facilitate the lesson, and just 2 students affirm that the instructor speaks only in English to make the course more clear. Generally, in order to facilitate the understanding process and to make the students more involved, the teacher resort to code switching in his lesson deliverance.

Table 30

Medium of English lesson explanation

Medium of lesson explanation	Participants	Percentage
Only in English	2	6,3%
Using Arabic and/or French	9	28,1%
All of them	21	65,6%
Total	32	100%

18: English lesson characteristics evaluation

Table 31

English lesson characteristics

English lesson characteristics	Participants	Percentage
the content of English course is linked to your field of study	25	25,8%
Appreciation of teacher teaching style	25	25,8%
the use audio-visual tools in English course	31	32%
Teaching method based on technical term translation only	16	16,5%
Total	97	100%

As shown in table 31, 32% of students think that English lesson is characterized by the use of audio-visual tools. 25 students believe that the English course content is linked to the field of study, and the same rate appreciates the teacher teaching style. One can notice that students evaluate English lesson characteristics according to their perceptions and their own learning style.

3.1.1.2.3. Target situation analysis. The target situation analysis section contains five questions related to the students' needs after learning English. It surveys to find out the participants' proposes for learning English, with whom they will use English, the frequency of using English, and what genre they will need in their future study or work.

19: The need of English learning to students' area of study

Figure14 illustrates the students' purposes for learning English, in which the majority of the participants (50%) reported that studying English is mainly needed for work, whereas 28,2% stated that English is required for studying. Moreover, 13,5% indicated that they will need the language for other objectives, just 7,7% of the answers pointed out that English is highly wanted for examination. From these statistics, one can deduce that even though, hydraulics L1 students are still young, their objectives are already identified and precise and that their main goal of learning English is to obtain the needed work.

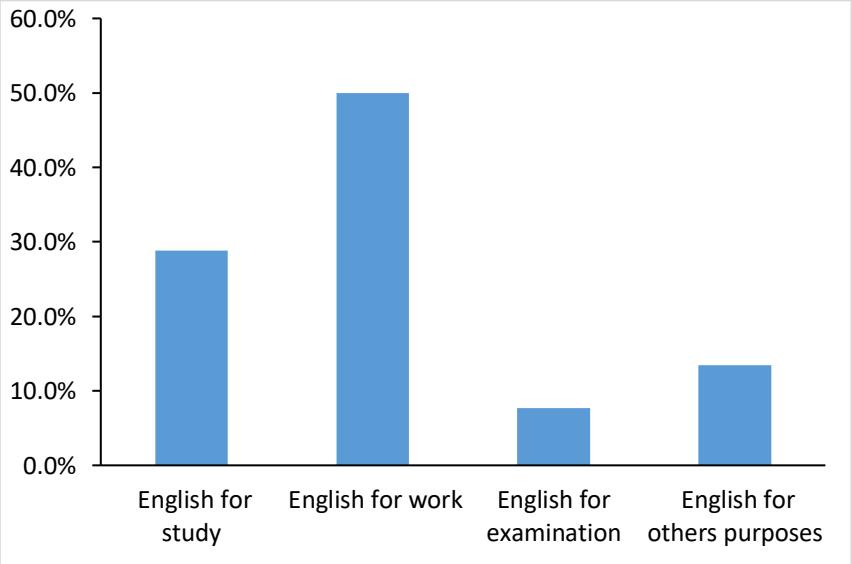

Figure 14. Students' purposes for learning English

20: With whom English will be used

This question was asked in order to identify the target persons with whom English would be used. The obtained results displayed in table 32 demonstrate that the majority of the participants expressed that English will be used with native speakers (40%) or teacher (32,7%). However, few of them thought that they will communicate the language with non-native speakers (13,3%) or with students (10,2%). The acquired high percentages (using English with native or teacher) may suggest that those students plan to achieve advanced studies or to live overseas.

Table 32

Target persons with whom English will be used

English is used with	Participants	Percentage
Native	20	40,8%
Non native	8	16,3%
Teacher	16	32,7%
Students	5	10,2%
Total	49,00	100%

21: Frequency of using English

As shown in table 33, half of the students (50%) argued that they speak only some words or phrases, 28,1% use English frequently, 18,8% talk rarely the language, and just one student uses language in full communication. The results indicates limited use of the English language.

Table 33

How often English will be used

Using English frequency	Participants	Percentage
Frequently	9	28,1%
Rarely	6	18,8%
Some words or phrases	16	50%
Full communication	1	3,1%
Total	32	100%

23: Genres needed in students' future study or work

Table 34 visualizes the obtained data concerning the genres required in students' future study or work. "Public speech", "formal/informal conversations" were classified as 30,2% and 22,6% respectively. "Reports" (17%), "academic articles" (15,1%) , and "manuals" (9,4%) are ranked third, fourth, and five respectively. Only three students answered "others" (5,7%) without specifying any option. The results demonstrate awareness from the students' part of the kind of genre they need in their field of studies and future carriers.

Table 34

Needed genre for future study or work

	Participants	Percentage
Reports	9	17,0%
Manuals	5	9,4%
Formal/informal conversations	12	22,6%
Academic articles	8	15,1%
Public speech	16	30,2%
Others	3	5,7%
Total	53	100%

24: Students stating their mind on any material in this questionnaire

Out of 32, 14 students answered this question, 11 responses was in Arabic and three was in English, in which they emphasized on the importance of English in their study and their future work. Some of them wanted English to be first language after their mother tongue, others needed more time for English classes. Moreover, one student who expressed his preference for integrate English starting from preparatory school.

3.1.1.3. Pretest-post-test descriptives comparison. The statistical analysis of the pretest-posttest design is usually approached descriptively as a starting point. The approaching also focus usually on two specific measures. From the measures of central tendency is the mean or average, and from the measures of spread is the standard deviation. The mean by principal give an idea about the location of the data set center while the standard deviation gives an idea of how spread the data set from the mean or its center. The two measures illustrate the difference between the two tests that could be ascribed to the treatment. Table 35 gives the pretest and post-test score summary and difference outcomes.

Table 35

Pretest-post-test descriptive comparison

PRETEST				POST-TEST			
P	Score	P	Score	P	Score	P	Score
P 01	04.50	P 24	13.00	P 01	07.50	P 24	07.00
P 02	11.50	P 25	13.00	P 02	08.50	P 25	10.50
P 03	09.00	P 26	10.50	P 03	11.00	P 26	07.00
P 04	08.00	P 27	03.00	P 04	11.50	P 27	03.50
P 05	04.00	P 28	12.50	P 05	08.00	P 28	07.00
P 06	08.50	P 29	13.00	P 06	07.50	P 29	09.50
P 07	09.50	P 30	09.00	P 07	07.50	P 30	09.50
P 08	07.00	P 31	08.00	P 08	07.50	P 31	03.50
P 09	05.00	P 32	05.00	P 09	05.50	P 32	05.00
P 10	11.00	P 33	07.50	P 10	05.50	P 33	08.50
P 11	01.50	P 34	12.50	P 11	08.50	P 34	06.50
P 12	06.50	P 35	08.00	P 12	05.00	P 35	09.50
P 13	14.00	P 36	08.00	P 13	09.00	P 36	10.00
P 14	06.00	P 37	07.50	P 14	04.00	P 37	07.00
P 15	04.50	P 38	10.50	P 15	08.00	P 38	10.00
P 16	09.00	P 39	08.50	P 16	09.00	P 39	03.00
P 17	08.00	P 40	08.50	P 17	05.50	P 40	09.00
P 18	07.00	P 41	13.00	P 18	09.00	P 41	08.00
P 19	09.50	P 42	06.50	P 19	10.00	P 42	06.50
P 20	09.50	P 43	12.00	P 20	05.50	P 43	14.50
P 21	10.00	P 44	6.50	P 21	08.50	P 44	08.00
P 22	09.50	P 45	09.00	P 22	07.00	P 45	06.00
P 23	09.50			P 23	10.50		
Σ_1	387.50	n	45	Σ_2	348.50	n	45
Mean ($\bar{X}_1$)	8.611	SD_1	2.894	Mean ($\bar{X}_2$)	7.744	SD_2	2.315
Difference (Σ_1- Σ_2)		39	Difference ($\bar{X}_1$ - $\bar{X}_2$)	0.867	Difference (SD_1 - SD_2)		0.578

Note. P = participant number. $\sum_1$ = Sum. n = 44. $\bar{X}_1$ = Pretest mean. SD_1= Pretest standard deviation. $\sum_2$ = Sum. $\bar{X}_2$ = Post-test mean. SD_2= Post-test standard deviation.

Table 35 recapitulated the scores obtained by the sample before and after treatment.

One can observe that the mean of post-test (7.744) is less than the mean of the pre-test (8.611), which means that the scores of post-test were decreased compared to those of the pre-test. This may explained by the fact that as mentioned previously the pre-test looked like English baccalaureate exam of scientific specialism in which the topic of reading text is related to the hydraulics specialty with general trend, and the text contain few technical terms. Moreover, the pre-test took place in September, it was not compulsory, and where the students still had fresh memory. In contrast, the post-test took place in January with other technical module, and the reading text was full of technical words, and quite difficult to the students' level.

3.1.2. Inferential statistics. Inferential statistics is undertaken to validate the descriptive observations and chiefly tests the research hypothesis. Inferential statistics basically infer the findings of the sample into the larger population. It is a more formal process that goes through a number of phases, which will be detailed below.

3.1.2.1. Inference assumptions. The first phase in the inferential statistics is to determine the type of test to be adopted for the hypothesis testing. Unless a number of assumptions are met, the determination cannot be made. The assumptions decide how confident the findings could be considered (Hatch and Lazaraton, 1991, p. 546). Thus, the data must satisfy the following assumptions in order to use the right statistic either parametric or non-parametric. Conventionally, the assumptions include data being as interval or ratio, data normally distributed, and random sampling from the population, with varying degrees of importance (Lazaraton and Ormrod, 1991, p. 546; Leedy and Ormrod, 2015, p. 240). Another assumption to be met is the homogeneity in the case of independent groups' design, which is not the case of the present research.

3.1.2.1.1. Data distribution. One of the commonly strived for assumptions in the choice of statistical procedures is the data distribution. The assumption stipulates normal distributions in order to use parametric tests, which is also the most commonly strived for category of inferential tests. Lazaraton and Ormrod (1991) describe it as "A normal distribution means that most of the scores cluster around the midpoint of the distribution, and the number of scores gradually decrease on either side of the midpoint. The resulting polygon is a bell-shaped curve" (p. 164). Conversely, if the data are not normally distributed they will not cluster around the midpoint and the gradual decrease will not be symmetrical, which would not result in a bell-shaped polygon. However, the data distribution can be

examined both visually and statistically. The figures 15 and 16 show the visual of the data distribution for the pretest and post-tests, which was illustrated using excel.

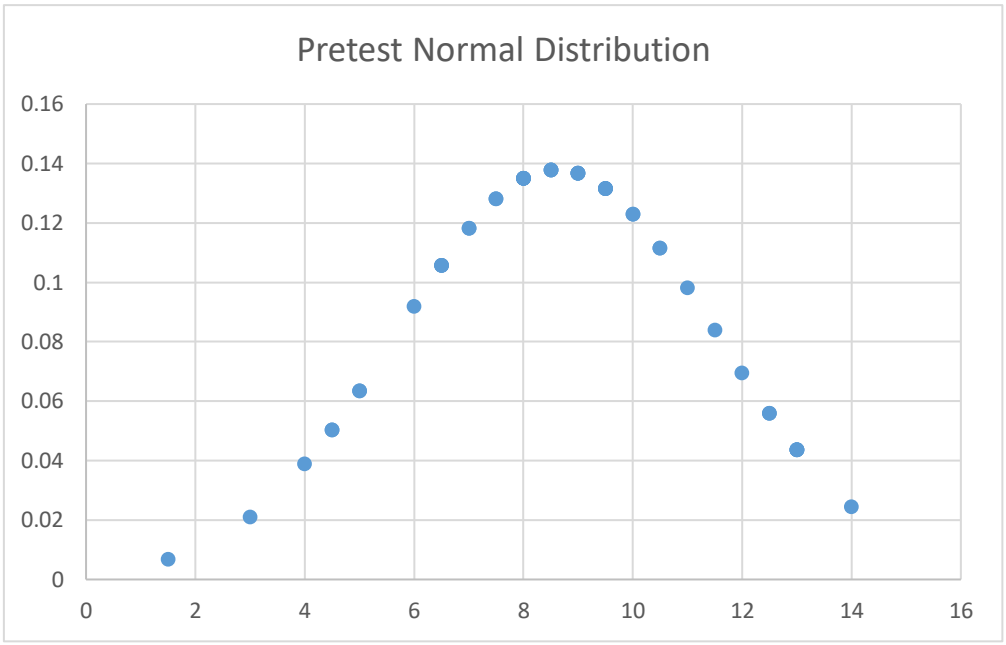

Figure 15. Pretest data distribution

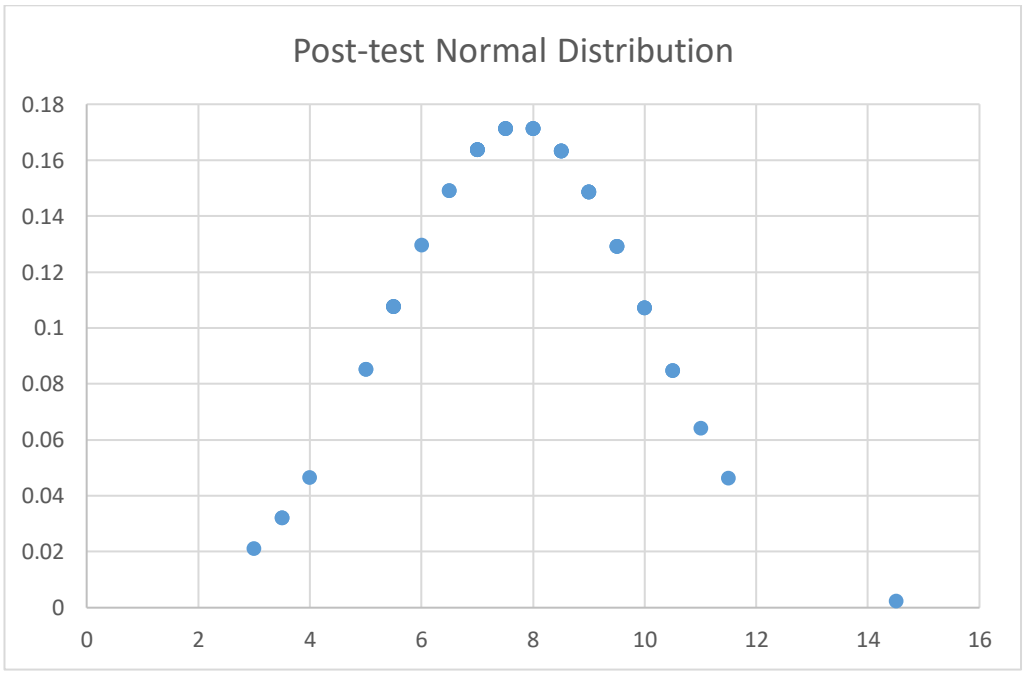

Figure 16. Post-test data distribution

As show the figures (13 and 14), both tests demonstrate normal distribution of their data following the bell-shaped polygons. A curved line creating what is conventionally known as the "normal curve" where it is slightly wider and lower in appearance for the pretest due to the higher standard deviation (SD_1= 2.894) than that of the post-test that is taller and thinner in appearance due to the lesser standard deviation (SD_2= 2.315). Thus, visual normal distribution has been verified and confirmed for both tests.

On the other hand, the statistical normal distribution check can be performed using the Shapiro-Wilk test. According to Greasley (2008, p. 91), this test is a more objective measure for testing if the distribution is normal or not and if a statistical significance is delivered by the test; then, the distribution is deviating from being normally distributed. Accordingly, a null hypothesis can be given. The H_0: the data distribution do not significantly deviate from a normal distribution. Accordingly, the test was executed for both tests. The table (36) shows the testing outcomes that was performed with SPSS.

Table 36

Testing for normal distribution of data

Shapiro-Wilk Test		Statistic	Ddl	Sig.
Pair 1	Pretests	0.978	45	0.528
	Post-test	0.980	45	0.622

Note. Ddl = Sample size. Sig= Significance level.

Table 36 gave the outcomes of the normal distribution test. Both tests gave p-values that are higher than the alpha, which is conventionally set at $\alpha = 0.05$, with $528 > 0.05$ for the pretest and $0.622 > 0.05$ for the post test. The values indicate no statistical significance, therefore, acceptance of the null hypotheses for both tests not significantly deviating from the normal distribution. Accordingly, the assumption of the normal distribution of data has been satisfied for the pretest and post-test.

Consequently, since the normal distribution assumption is met; in addition to, the other two assumptions of the ratio data and cluster sampling the parametric tests can be performed for this particular research instance. On this conclusion, another decision can also be made is the types of parametric test. For a sample that is related, the paired-samples t-test is the eligible test for again for this research instance also.

3.1.2.1. Testing paired differences (Paired samples T-test). In statistics and broadly speaking, the paired-samples t-test checks the difference in the tests performed for a one group before and after treatment to determine its effectiveness. However, in statistics and narrowly speaking, Ross and Wilson (2017) defined "A paired-samples *t*-test … compares

the mean of a single group, examined at two different points in time" (p. 15), and the statistical significance would determine the effectiveness of experiment. In order to perform the paired-samples t-test, compliance with the same assumptions as parametric tests decisions is a must. Since those assumptions are already satisfied, the Paired-sample t-test was initiated, which outcomes are provided in a three phase illustration (tables 37, 38, and 39) as provided by the SPSS.

Table 37

Paired-samples t-test descriptive statistics

Shapiro-Wilk Test		Mean	n	Standard deviation	Standard error mean
Pair 1	Pretests	8.611	45	2.894	0.431
	Post-test	7.744	45	2.315	0.345

Note. n = Sample size.

The two paired variables descriptive statistics are given in the table 37, which is the first illustrative phase.

Table 38

Paired Samples Correlations

		N	Correlation	Sig
Pair 1	Pretests & Post-test	45	0.321	0.032

Note. n = Sample size. Sig= Significance level.

The two paired variables correlations are shown in the table 38, which is the second illustrative phase. The given p-value is less than the alpha (0.032< 0.05), which indicates significant correlation shared by the pretest and posttest. That is, one participant is likely to score similarly on both tests (Ross and Wilson, 2017, p. 19).

Table 39

Paired-Samples T-test: Testing paired differences

		Mean	SD	SEM	95% Confidence interval of the difference		t	Ddl	Sig. (2-tailed)	Sig. (1-tailed)
					Lower	Upper				
Pair 1	Pretests & Post-test	0.86667	3.07187	0.45793	-0.05622	1.78956	1.893	44	0.065	0.0325

Note. SD = Standard deviation. SEM = Standard error mean. t = t-value (t-test). Ddl = sample size. Sig= Significance level.

The two paired variables differences testing is shown in the table 39, which is the third illustrative phase. The mean difference (0.86667) is significant enough to indicate the possibility that the treatment positively impacted the students. On the other hand, one can note a p-value that is less than the alpha for a one tailed hypothesis (0.0325< 0.05). The value also indicates statistical significance of the paired-samples t-test, which permits to reject the null hypothesis that states H_0: a zero for the mean difference between the pretest and the post-test. As a result, the acceptance of the null hypothesis means that if the students in the hydraulics field learn English from a syllabus specifically designed to meet their needs and rises to their expectations, their competency in English will be significantly improved.

3.2 Results discussion

After collecting, presenting and analyzing the data, the researcher has to discuss and interpret the obtained findings by relating them to the research hypotheses and research questions for proving the significance of the study and ensuring if the planned objectives will be achieved or not.

3.2.1. Research question one. Why is there a dire need for the revision and assessment of the old syllabus?

Related to this question, the teachers who participated in this investigation were asked: Is there any syllabus for technical English do you rely on? If no, what do you do? Explain. From 30 participants, 17 teachers affirmed there is no syllabus for technical English, and they argued that they prepared and designed their own syllabus according to the students' needs. Others declare that they adapted the existing program based on students' objectives; however, some of them simply translate his course from French to English. The diversity of the teachers' answers is clear a sign of an urgent need for a new designed syllabus based on the adjustment and the evaluation of the old syllabus, if it exist. Designing a new ESP syllabus for the students of licence in hydraulics could curb the teachers' random selection and adaptation, and encourage them to be more effective.

3.2.2. Research question two. What are the pitfalls of the previous intuitively-designed syllabus?

With reference to the old syllabuses designed for L1 science and technology, L2 sciences and technology and L2 hydraulics (national division), the pitfalls of the previous intuitively-designed syllabuses may be summarized as follows:

- The old syllabus was designed by the ministry of high education and the scientific research without taking into account learners' needs, objectives or wants neither teachers' suggestions, or considering general needs and broad aims.
- The old syllabus focused on the lexicon terminology and grammar structures while ignoring the communicative side of ESP courses.
- The old syllabus was very loaded in term of lexical features (taking in consideration all the specialisms of sciences and technology faculty).

3.2.3. Research question three. What do hydraulics learners expect and need from studying English?

In reference to the students' questionnaire, when the students were asked why they need to study English in their area of study, the majority of the participants stated that learning English is mainly needed for work or study. One can deduce that even though, hydraulics L1 students are still young, their objectives are already identified and precise that their main goal of learning English is to obtain the needed work, and they are sufficiently aware about the role that can play English language in their future career or job. In fact, these are the current students' needs because they are fresh students, and they are not mature enough to judge that they decided about their future definitely. Perhaps, when they will be master students they will be thinking differently and more mature aims and wants will be expressed.

3.2.4. Research hypotheses. The study comprises an alternative hypothesis and a null hypothesis, which are respectively:

H_a: If students in the hydraulics field learn English from a syllabus specifically designed to meet their needs and rises to their expectations, their competency in English will be significantly improved.

H_0: If students in the hydraulics field learn English from a syllabus specifically designed to meet their needs and rises to their expectations, their competency in English will not be significantly improved.

According to the undertaken experimental, one can notice that the scores of the post-test were significantly enhanced comparing to those of the pre-test. Furthermore, the inferential statistics using the paired-samples t-test seemed to validate the significance beheld between pre-test and post-test. Therefore, probability of the null hypothesis (H_0) is rejected and the alternative hypothesis is affirmed.

In summary, this chapter gave details and interpretations to the gathered research data. It also discussed the three research questions as well as the research hypotheses. All in all, it highlighted the field work and detailed the main research findings.

3.2.5. Course design. In the department of civil engineering and hydraulics, students of hydraulics division start learning English in second year for two semesters and in master level for one semester. The new tendency of the Ministry of High Education and Scientific Research emphasizes on teaching/ learning English instead French, and even teaching technical modules in English. As result, teaching English in Hydraulics division will take five semesters in addition to the modules of specialism that will be taught in English. One can notice the existence of an old syllabus designed for semesters 3 and 4 planned by the Ministry of High Education and Scientific Research founded on general aims.

In order to cover all license levels, the old syllabus design has to be revised and adjusted based on the students' needs gathered through various research tools during this study.

3.2.5.1. Course aims. License's hydraulics students in the department of civil engineering and hydraulics need English for several purposes:

- To be familiar with English books, journals, and magazines related to their specialism,
- To effectively read and write technical passages in English
- To be able to translate technical and semi technical vocabulary.
- To be able to design and present technical projects in English
- To sit for formal exam,
- To increase students' opportunities to work or study overseas.

3.2.5.2. Goals and objectives. Students need to be able to familiarize themselves with technical lexicon and produce write effective English written texts by the end of the course. For instance, to have the ability to ask and answer questions and to complete written assignments. To be able to comprehend translated scientific papers and compose effective abstracts in their field of study. To be capable to present oral presentation inside or outside the classroom.

The objectives for each skill are as follows:

a) Reading:

- To grasp a diversity of texts in English related to their specialty, such as books, reports, diagnosis documents, and articles.
- To extend the technical diction vocabulary of the students

b) Writing:

- To write passages, paragraphs, motivation letters, and CV.
- To perform writing techniques, such as paraphrasing, summarizing, and citing.
- To complete written exercises.

c) Listening:

- To understand oral discourses in English related to their area of study
- To understand oral presentations in conferences.

d) Speaking:

- To ask questions and to debate in classroom
- To present an oral discourse.

3.2.5.3. Course organization. The course of English will be in form of lecture over four academic semesters, a duration of twelve weeks and the length of one hour and half weekly, with a total number of hours of 96 from start to finish. The section size is depending on the number of the enrolled students in Hydraulics division each year. The target students are L1 and L2 hydraulics division in the department of civil engineering and hydraulics.

3.2.5.3.1. Course content. In In relation to the needs analysis findings (the students' and teachers' questionnaires and the treatment), it appears that the most important skills are reading, writing, then speaking. So, the first skill to be tackled is reading. The latter is regarded to be the foundation and the starting point in learning a language because it complements and facilitates the development of the writing, and speaking skills. Reading requires much extensive and continual practice. In order to improve reading skills, two types of reading activities should be planned, extensive and intensive reading. The intensive reading is normal reading of short passages, which may be used to improve grammar skills, vocabulary, and comprehension and it should be integrated in the year. However, the extensive reading t is a speedier method of reading lengthy material in order to develop writers' organizational strategies. The types of activities used to develop reading skill are: encouraging silent reading and aloud reading of authentic passages, skimming, scanning in order to deduce the theme of the passage, the exercises of using fill in the blank vocabulary, encouraging students for the extensive reading.

The second language skill to be undertaken is writing. Among the four language skills, writing is a highly demanding ability that necessitates mastery and balance of both

linguistic knowledge and communicative skills. To develop the writing skill and to cover mistakes (related to grammar or writing deficiency), various types of exercises should be implemented, such as activities of taking notes of authentic material, fill in the gaps, combining sentences, reordering misplaced-sentences, summarizing passages or paragraphs. The third skill to develop is speaking. It is very important and seems to be the most difficult skill to be acquired because it needs much more practice. To enhance speaking skill, teacher should encourage classroom conversations, such as group presentation, role-playing, asking and answering questions, discussion and debate specific topic. The most neglected skill in several language syllabus is listening; however, it can be efficient in developing other skills, such as speaking, and reading.

3.2.5.3.1. Teaching material. The materials to be selected for teaching English for hydraulics students should be authentic (books, professional articles, from the web), and strongly related to the area of study. They should be relevant to the students' level, stimulate students to learn, give the learners the opportunities to utilize their existing knowledge and improve it.

Assignments: Students are asked to complete the questions related to texts (global comprehension, detailed comprehension, synonyms, antonyms, grammar questions, and fill in the gaps). They are requested to perform role-playing of the dialogue that precede each course.

Testing and assessment: Before the beginning of the courses, a diagnostic test was done to assess the students' proficiency level in English and an achievement exam at the end of the semester.

The table 40 presents the redesigned Hydraulics ESP course.

3.3 General Conclusion

Since its emergence, English for specific purposes (ESP) has developed and extended locally and globally. ESP provides effective teaching especially if the related syllabus is carefully designed and founded on learners' needs, expectations, and objectives at the beginning, during, and at the end of learning process. Unfortunately, teaching and learning ESP in the hydraulics division in the department of civil engineering and hydraulics in the University of Biskra faces several problems due to the lack of a suitable ESP syllabus, the limited allocated time, and the deficiency of teaching materials. Considerations of the learners' levels, needs, and goals are practically absent. Furthermore, instructional decisions such as course topic, method, and assessment are not focused on learners' motivations for learning. The present research investigated the assessment of the ESP syllabus of Hydraulics subject area and the efficiency of the redesigned, comprehensive experimental syllabus.

The research design adopted in this study was the quasi-experimental that perfectly addressed the research aims, responded to the proposed research questions, and judged to acceptance or rejection the proposed hypotheses. The sample used in this research is of 45 participants from the first year LMD students of hydraulics at the department of civil engineering and hydraulics at Biskra University. The sample comprised a one group following the pre-experimental design: the one group pretest-post-test design.

The mixed-method approach was selected in order to investigate the qualitative method that aimed at gathering numerical data, which proved the alternative hypothesis as well as the qualitative method that provided the verbal clarification to the first and second research questions. One can observe that the teacher questionnaire (Appendix 01) was more open compared to the students' questionnaire (Appendix 02) for the sake of exploring their attitudes and perceptions of the ESP situation at Biskra University.

The experimental stage consisted of the treatment that took the whole first semester on the academic year 2022/2023. The treatment was conducted during two months and half for two sessions weekly and covered four lessons. When the treatment was over, an attainment post-test was performed in order to check the treatment efficacy as well as the proposed hypotheses. The collected data were treated through both statistical description and statistical inferencing in which the latter enabled the null hypothesis testing; however, the former permitted answering the research questions.

The obtained descriptive results answered the first research questions by indicating the urgent need for a new designed syllabus based on the adjustment and the evaluation of the old syllabus after identifying the pitfalls. Designing a new ESP syllabus for the students of license in hydraulics could curb the teachers' random material selection and adaptation, and encourage them to be more effective. The third research question was answered descriptively through the students' questionnaires where they highlight that they needed English for work and inferentially by rejecting the null hypothesis in favor of alternative hypothesis. Thus, if students in the hydraulics field learn English from a syllabus specifically designed to meet their needs and rises to their expectations, their competency in English will be significantly improved.

3.3.1 Study limitation. Any research study has its limitations in terms of time, research tools, sample, or experimental conditions. For this work, the treatment was first planned for two semesters with two sessions per a week in which seven lessons will be taught. By the end of the first term examination, the Ministry of High Education and the Scientific Research ordered all the transversal modules to be taught online. Therefore, the experimental study was limited to only one semester, and just four lesson were tackled. Concerning the scores of pre-test and post-test, one can observe that scores of post-test were less than those of pre-test. This may be explained by the fact that as mentioned previously the pre-test looked like English baccalaureate exam of scientific specialism in which the topic of reading text is related to the hydraulics specialty with a general trend, and the text contained fewer technical terms. Moreover, the pre-test took place in September, it was not compulsory, and where the students still had fresh memory. In contrast, the post-test took place in January with other technical modules, and the reading text was full of technical words, and quite difficult to the students' level. Despite the fact that many drills and activities were assigned to the students in the classroom or at home, students still struggled with present tense especially in asking auxiliary or Wh questions.

3.3.2 Recommendations

Future researchers should take into account the limitations of this study and try to adopt the treatment of the two groups (experimental group and control group) during two semesters. The Decision maker's need to consider teaching ESP as an important module and take into consideration the findings of the researches ESP-related in order to implement them in real life situations for technical students.

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Appendices

Appendix 1: Teacher Questionnaire

TEACHERS' QUESTIONNAIRE

Respected Teachers

The present questionnaire aims to collect data related to the assessment of the ESP syllabus for Hydraulic students. Therefore, I will be grateful if you contribute in this study by answering the down listed questions. Your responses will be of great use and highly appreciated.

Please tick (✓) the appropriate box or make full answers to express your opinion. The answers will be kept confidential and anonymous.

I. Personal Information

1. Gender

   Male ☐ Female ☐

2. What is your qualification?
   a) Licence (classical system) ☐
   b) Master (LMD) ☐
   c) Magister ☐
   d) Doctorate ☐

3. What is your specialism ?

   ……..……..

4. What is your status as a teacher? :
   a) Permanent teacher ☐
   b) Part-time teacher ☐

5. How long have you been teaching English? ……..….. years.

6. Do you teach
   a) First year students ☐
   b) Second year students ☐
   c) Third year students ☐
   d) Master one students ☐

7. How many hours do you teach in a week?
   a) one hour and half ☐
   b) Three hours ☐
   ☐

c) More than three hours

8. Do you have large classes?

Yes ☐ No ☐

9. How do you find the students' attendance in English classes?

a) Acceptable ☐
b) Somewhat acceptable ☐
c) Not acceptable ☐

10. Do English classes take place in form of:

a) Lectures ☐
b) TDs ☐
c) Both ☐

11. Do you teach

a) General English (GE)) ☐
b) English for specific purposes (ESP) ☐
c) Both ☐

12. Did you have any training in teaching ESP?

Yes ☐ No ☐

13. Do you think that it is necessary for students of technical fields to learn English?

Yes ☐ No ☐

If yes, what are the reasons?

……
……
……

14. Do you think that students need English to:

a) Understand scientific lectures in English ☐
b) Participate in oral English discussions ☐
c) Read scientific textbooks in English ☐
d) Write scientific reports or publications in English ☐

15. Which of the following skills do you emphasize when teaching English to students for technical fields? Please classify them by means of importance (1-most important, to 4-least important).

a) Speaking ☐
b) Writing ☐
c) Reading ☐
d) Listening ☐

16. When teaching, do you tend to focus more on:

a) General grammatical notions ☐
b) Grammatical structures related to technical field ☐
c) Lexical items related to general English ☐
d) Lexical items related to general English ☐

17. Do you collaborate with the subject lecturers (teacher of technical field)?

Yes ☐ No ☐

18. When teaching, do you use:

a) Textbooks related to general English ☐
b) Textbooks related to technical English ☐
c) Documentation used the students in their own field of study ☐
d) Your own prepared materials (texts, exercises, videos,..ect) ☐

19. Is there any syllabus for technical English do you rely on?

Yes ☐ No ☐

If no, what do you do? Explain

……
……
……

20. Do you use translation to French or Arabic when teaching?

Yes ☐ No ☐

If yes, what are the reasons?

……
……
……

21. How much do you think technical students are interested in learning English?

a) Most of them ☐
b) Some of them ☐
c) Few of them ☐

22. How do you assess your students

a) Oral test ☐
b) Written test ☐
c) Both ☐

23. You can state your mind on any material in this questionnaire or add what you feel is missing.

.....
.....
.....
.....
.....
.....

Thank you for your cooperation

Mrs. Ounoki Samira

Appendix 2: Student Questionnaire

STUDENTS' QUESTIONNAIRE

The present questionnaire is mainly designed for L1 students of Hydraulics at the Department of Civil Engineering and Hydraulics (M.K University of Biskra). It aims to collect data related to the assessment of the ESP syllabus for Hydraulic students. Therefore, you are kindly invited to answer the questions. Your responses will be of great use and highly appreciated.

Please tick (✓) the appropriate box or make full answers to express your opinion. The answers will be kept confidential and anonymous.

هذا الاستبيان موجه أساسا لطلبة سنة أولى ليسانس ري بقسم الهندسة مدنية والري بجامعة بسكرة. ويهدف لجمع المعطيات المتعلقة بتقييم منهج تدريس الإنجليزية لأهداف خاصة لطلبة الري. لهذا أنتم مدعوين للإجابة على هذه الأسئلة. نشكركم على اجاباتكم مسبقا لأنها ستكون مفيدة جدا لنا.

من فضلكم ضع العلامة(✓)في الخانة المناسبة او اكتب إجابات كاملة للتعبير عن رأيك. سرية الإجابات أولويتنا القصوى.

II. Personal Information (معلومات شخصية).

23. Gender (الجنس)

Male (ذكر) ☐ Female (أنثى) ☐

24. Age (السن)

18 ☐ 19 ☐ 20 ☐ 21 ☐ Others

25. Mother tongue (اللغة الأم)

e) Arabic (العربية) ☐
f) Berber (الأمازيغية) ☐
g) French (الفرنسية) ☐
h) Others (لغات أخرى) ☐
i) Please specify : ……..

26. Do you consider learning English (هل تعتبر تعلم الإنجليزية) :

a) Important (مهم) ☐
b) Somewhat important (نوعا ما مهم) ☐
c) Unimportant (غير مهم) ☐

27. Do you think learning English is (هل تظن أن تعلم الإنجليزية):

a) Easy (سهل) ☐
b) Difficult (صعب) ☐
c) Intermediate ((متوسط ☐

III. Present situation analysis

28. How long have you been studying English? (كم عدد السنوات التي درست فيها الإنجليزية؟):
……. years.

29. Have you earned any degree in English language? (هل تحصلت على شهادة ما في اللغة الإنجليزية؟)

Yes (نعم) ☐ No (لا) ☐

If yes, what type of degree have you earned? (اذا كان الجواب نعم ما هو نوع الشهادة المتحصل عليها؟)

……

30. Have you ever received any tutoring by an English native teacher? (هل تلقيت تكوينا من أستاذ لغته الأم الإنجليزية؟)

Yes (نعم) ☐ No (لا) ☐

If yes, for how long? (اذا كان الجواب نعم ما هي المدة الزمنية؟): ……..

31. Do you think English is important to your area of study? (هل تظن أن الإنجليزية مهمة لتخصصك؟)

Yes (نعم) ☐ No (لا) ☐

32. Do you use English in your study? (هل تستعمل الإنجليزية في دراستك؟)

Yes (نعم) ☐ No (لا)

If yes, is it for(اذا كان الجواب نعم، هل ذلك لـ :

a) Speaking (التكلم) ☐
b) Writing (الكتابة) ☐
c) Doing both (الاثنين معا) ☐

33. Do you attend English classes? (هل تحضر دروس الإنجليزية؟)

a) Always (دائما) ☐
b) Usually (عادة) ☐
c) Sometimes (في بعض الأحيان) ☐
d) Rarely (نادرا) ☐
e) Never (أبدا) ☐

34. How many hours a week you study English? (كم ساعة في الأسبوع تدرس الانجليزية؟):
……...hours.

35. Do you think that the allocated time to English course is sufficient?

(هل تظن ان هذه المدة الزمنية المخصصة للإنجليزية كافية؟)

Yes (نعم) No ☐ ☐

36. If no, how much time do you think is necessary to learn English every week?

(اذا كان الجواب لا، ما هي المدة الزمنية في الأسبوع اللازمة لتعلم الإنجليزية؟)

a) 3 hours ☐
b) 4.5 hours ☐
c) 6 hours ☐

37. Do you use English in (هل تستعمل الإنجليزية في):

a) English classes Only ☐

b) area of study ☐

c) Both classes ☐

38. Classify the following English skills according to your current proficiency level?

(رتب المهارات اللغوية التالية حسب مستوى كفاءتك الحالية؟)

Language skills	Very good جيد جدا	Good جيد	Acceptable مقبول	Weak ضعيف	Veryweak ضعيف جدا
Speaking (تكلم)					
Reading (قراءة)					
Listening (استماع)					
Writing (كتابة)					
Grammar (قواعد)					
Pronunciation (نطق)					

39. Classify the following English language skills according to their importance in your academic area of study. (رتب المهارات اللغوية التالية حسب أهميتها لتخصصك الأكاديمي)

Language skills	Very important مهم جدا	Important مهم	Somewhat important نوعا ما مهم	Not important ليس مهما
Speaking(تكلم)				
Reading (قراءة)				
Listening(استماع)				
Writing (كتابة)				
Grammar (قواعد)				
Pronunciation(نطق)				
General vocabulary مفردات عامة				
Technical vocabulary مفردات تقنية				

40. How does your teacher explain the English lesson? (كيف يقوم الأستاذ بشرح الدرس؟)

a) S/he explains the lesson content only in English ☐
(يشرح الدرس بالانجليزية فقط)

b) S/he explains the lesson content using Arabic and/or French languages. ☐
(يستعمل العربية و/أو الفرنسية لشرح الدرس)

c) S/he uses all of them ☐
(يستعمل اللغات الثلاثة)

41. How do you evaluate these English lessons characteristics?(كيف تقيم خصائص درس الإنجليزية)

Lesson characteristics	Yes	No
Is the content of English course linked to your field of study? هل محتوى الدرس له علاقة بتخصصك؟		
Do you appreciate the teaching style of your teacher? هل تستحسن طريقة تدريس الأستاذ؟		
Do you prefer to use audio-visual tools in your English course? هل تحبذ استعمال الوسائل السمعية البصرية في درس الإنجليزية؟		
Is teaching method based on technical term translation only? هل طريقة التدريس تعتمد إلا على ترجمة المفردات التقنية؟		

III. Target situation analysis

42. Why do you need to learn English in your area of study ? (لماذا تحتاج لدراسة الإنجليزية في تخصصك؟

a) For study(للدراسة) ☐
b) For work(للعمل) ☐
c) For examination(للامتحان) ☐
d) For other purposes (غايات أخرى) ☐

Specify :

……

43. With whom will you use the language? (مع من ستستعمل الإنجليزية؟)

a) English native speaker (متحدث لغته الأم الإنجليزية) ☐
b) Non-native speaker (متحدث لغته الأم ليست الإنجليزية) ☐
c) Teacher (الأستاذ) ☐
d) Students (الطلبة) ☐

44. How often do you use English language? (كم مرة تستخدم اللغة الإنجليزية؟)

a) Frequently (مرارا) ☐
b) Rarely (نادرا) ☐
c) Some words or phrases (بعض الكلمات أو الجمل) ☐
d) Full communication (محادثة كاملة) ☐

45. What is the main factor that could lead to the success of teaching English in your Department? ما هو العامل الأساسي الذي قد يؤدي إلى نجاح تدريس الإنجليزية في قسمك؟

a) Availability of an appropriate teaching textbooks (توفر كتاب التدريس المناسب) ☐
b) Adequate teaching materials (وسائل التدريس الملائمة) ☐
c) Small classes (أقسام صغيرة) ☐
d) Appropriate syllabus (المنهج المناسب) ☐
e) All of them (الكل) ☐

46. What genres will you need in your future study or work?
(ماهي أنواع النصوص التي قد تحتاجها في دراستك او عملك المستقبلي)

a) Reports (تقارير) ☐
b) Manuals (كتيبات) ☐
c) Formal/informal conversations (محادثات رسمية وغير رسمية) ☐

d) Academic articles (مقالات أكاديمية)

e) Public speech (حديث عام)

g) Others (أخرى)

Specify:…….....

30. You can state your mind on any material in this questionnaire or add what you feel is missing (يمكنك التعبير عن رأيك بشأن أي مادة في هذا الاستبيان أو إضافة ما تشعر أنه لم نتطرق له)

.....

.....

.....

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.....

.....

.....

Thank you for your cooperation

شكرا على تعاونكم

Mrs. Ounoki Samira

Appendix 3: Pretest

FACULTY *OF* SCIENCES AND TECHNOLOGY

Department *of* Civil Engineering and Hydraulics **Major:** Hydraulics

Levels: L1+L2+M1(hyd) **Time Allotted**: 1hr 30

Module: Technical English **Instructor** Prof. Ounoki, S.

Full Name	**Group**	**Marks/ 20**

DIAGNOSTIC TEST

Water scarcity, both natural and of human origin, is the lack of sufficient **available** water resources to meet the **demands** within a region. Water is **unequally** distributed over time and space. Much of it is wasted, **polluted** and **unsustainably** managed.

There is no global water scarcity as such, but a number of places and regions are **chronically** short of water because its use at the global level has increased more than twice as fast as the population over the last century.

Pressure on water resources is increasing in several parts of the world, especially in China, India, Pakistan, in the Middle East and many countries and regions of Africa.

Glossary

available: accessible **demands**: insist request **unequally**: not equal

polluted: not pure **unsustainably**: wrongly **chronically**: always

A/ Comprehension:

1-*Circle the letter that corresponds to the right answer.*

- The text is about: a/water resources b/ water quality c/ water scarcity
- Water shortage origins are : a/ natural b/human c/both of them

2- *Are these statements true (T) or false (F) according to the text? Write T / F in the space provided.*

1. ____. Water scarcity is the available water resources to meet the demands within a region.
2. ____ . There is global water scarcity as such.
3. ____. Pressure on water resources is increasing in several parts of the world especially in USA,UK, and Japan.
4. ____. Water is unequally distributed over time and space.

3- *Answer the following questions according to the text.*

1.What is water scarcity?

.....

.....

2. What are the reasons of water scarcity?

.....

.....

.....

3. Why is certain regions such as China, India and the Middle East more affected by water scarcity than other regions?

.....

.....

.....

4. What do the underlined words in the text refer to?

a/it (l§) ..... b/its .....

B- Text exploration

1)- *Find in the text words that are closest in meaning to the following:*

a/shortage ..... b/ usage .....

2. Find in the text words that opposite in meaning to the following:

a. abundance =/= ..... b. decreased: .....

3)- *Give the correct forms of the verbs in brackets.*

Water resources (be) unequally ..... distributed over time and space. In the past, people (drink) ..... from rivers without worrying about their health, water quality (use)..... to be safe.

C. English Phonology

The present tense 's is characterized by the addition of -s with he/she/ it. It is pronounced in three different ways. Pick out from the text words where -s is pronounced:

/s/	/Z/	/Iz/

D. Cloze Test: *Fill in the gaps with words from the box*

source- effluents- life- contamination- years- rivers

Water pollution can be defined as the __(1)__ of water bodies. Water pollution is caused when water bodies such as __(2)__, lakes, oceans, groundwater and aquifers get contaminated with industrial and agricultural __(3)__.

When water gets polluted, it adversely affects all __(4)__ forms that directly or indirectly depend on this __(5)__. The effects of water contamination can be felt for __(6)__ to come.

1	2	3	4	5	6

E. Paragraph Writing (Jumbled Sentences): ***Re-order these jumbled statements to make a coherent paragraph.***

a. Not only that, it's fit for human consumption at the source (and kept in that state until bottled).

b. but it can't be chemically treated.

c. And it's also protected within certain set vulnerability perimeters to avoid pollution and contamination

d. without passing through a community water system.

e. All spring water comes from a known named underground source,

1	2	3	4	5	6

.....

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.....

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.....

Best of luck

Appendix 4: Treatment Lessons Tentative

Lesson Contents [Tentative]

Lesson One: Welcome to Biskra

To be in declarative, negative and interrogative statement

Lesson Two: Socializing

To have in declarative, negative, and interrogative statements

Lesson Three: About the Conference

Present simple in declarative, negative, and interrogative statements

Lesson Four: At the Conference

Present continuous in declarative, negative, and interrogative statements

Lesson Five: The Plenary Session

Present perfect in declarative, negative, and interrogative statements

Lesson Six: Discussion & Debate in the Conference

Expressing obligation: Must-need-ought to-should-have to

Lesson Seven: A Tour around Biskra

Future simple in declarative, negative, and interrogative statements

Appendix 5: Treatment Lesson N° 01

Lesson 1 Welcome to Biskra

Outcomes: *Upon the completion of lesson 1, students will be able to*:

1. greet people

2. ask auxiliary and wh- questions (to be in the present simple)

3. check in (Ziban Hotel)

4. read a short passage

Grammatical Items

1. To Be in the present simple

2. Interrogative with to be

3. simple subject, verb, complement sentences.

4. Mechanics of writing (capitalization of proper nouns, capitalization of first letters in sentences; full stop (American: Period).

Lexical Items

check in- nice to meet you- you are very welcome-warm welcome- there is one way to find out-spacious- quiet-comfortable- spicy-menu

Cultural Insights

Hoover Dam- Couscous- dates- shorba frik

<u>Dialogue 1</u>

At the National Airport of Biskra. Professor Bashir Sidi-Othman (BSO) and Professor Imen Benomar are waiting for Professor John Waters and Dr. Jennifer MacMaster. They are from Arizona, USA. They are guests in the International Conference on Management of Water in Arid Zones. The Conference is this month. Here they are.

Prof BSO: Welcome to Biskra Prof. Waters. Welcome to Biskra Dr. MacMaster.

Prof. Waters: Nice to meet you, Prof. Sidi-Othman. Nice to meet you Prof. Benomar.

Prof. Benomar: Nice to meet you Prof. Waters and Dr. MacMaster.

Prof. Macmaster: We are very happy to be here with you.

Prof. BSO: The car is outside. Ziban Hotel is 15 minute-drive from the Airport.

Prof. Benomar: Your rooms are booked and a special menu is ready for you.

Prof. MacMaster: Thank you for the warm welcome.

Prof. BSO: You are very welcome.

Dialogue 2

At the Ziban Hotel, the reception clerk is all smile and polite.

Reception Clerk: Welcome to the Ziban Hotel.

Prof. Waters: We are booked under Prof. Waters and Dr. MacMaster.

Reception Clerk: How long are you staying?

Prof. Waters: We are staying seven days and six nights.

Reception Clerk: Your passports please.

Prof. Waters: Here is mine.

Dr. MacMaster: And here is mine.

Reception Clerk: Room 301 for Mr. John Waters. And Room 302 is for Mrs. Jennifer MacMaster. Both rooms are spacious, quiet, comfortable, and have a look on the garden. Here are the keys. Nice stay.

Prof. Waters: Thanks.

Prof. BSO: We meet 30 minutes from now in the restaurant. There, down the corridor.

Dr. MacMaster: Okay. Thanks again.

Dialogue 3

At the restaurant of the Ziban Hotel.

Prof BSO: Ladies first. Please be seated. Dr. MacMaster across from Prof. Benomar. Prof. Waters across from me.

Prof. Waters: Thank you.

Prof. BSO: It is all right.

Dr. MacMaster: Is traditional food on the menu?

Prof. Benomar: There is one way to find out. Waiter, please.

Waiter: At your service, ladies, gentlemen. Are you ready for lunch?

Prof. BSO: Yes, please.

Dr. MacMaster: Isn't this the famous Couscous?

Prof. Benamor: As a matter of fact, it is. All around, there are meat and vegetables.

Prof. Waters: And what about this soup? It is spicy, isn't it?

Prof. Benamor: It is *Shorba Frik*. Indeed, it is spicy and tasty.

Prof. Waters: Are these dates from around here?

Prof. BSO: These are the best dates in the world. They are local dates. And this is Guedila. It is also local mineral water. It is pure. It is cool. Enjoy.

Dr. MacMaster: Thanks.

Text 1: Read the text, and answer thoroughly the questions.

Hydraulics is the science of fluids for example water, oil, at rest and motion. It is related to fluid mechanics, which in large part is its theoretical foundation. Hydraulics is about such matters as the flow of liquids in pipes, rivers, and channels and their confinement by dams and tanks. The French scientist Blaise Pascal and Swiss physicist Daniel Bernoulli, are the pioneers of modern hydraulic power technology. Pascal's principle (1650), states that pressure in a liquid is equal in all directions; i.e, when water is made to fill a closed container, the application of pressure at any point is transmitted to all sides of the container.

Global Comprehension

1. What is hydraulics?

2. What are the matters of hydraulics?

3. Who are the pioneers of modern hydraulic power technology?

Detailed Comprehension

1. Which field is considered as the theoretical foundation of hydraulics?

2. What does hydraulics exactly study?

3. What does Pascale's principle state?

Lexis:

Synonyms: *Find in the text words closest in meaning to the following*

a. aqueduct = b. reservoir = c. energy =

Antonyms: *Find in the text words opposite in meaning to the following*

a. rest ≠ b. Practical ≠ c. ancient ≠

Text Two*: Read the text then fill in the text from words in the box*

water-visitors-building-border-irrigation-large-sightseeing- power-reservoir-flood

The Hoover Dam is a **__1__** dam on the Colorado River. It is on the **__2__** of the states of Arizona and Nevada. The **__3__** it made is called Lake Mead. The dam is named after the former US President Herbert Hoover. At first it was called "Boulder Dam", but the name was changed to honor Hoover, who was president when the idea of **__4__** the dam started. The dam is used for **__5__** and silt control, hydroelectric **__6__**, agricultural **__7__**, and domestic **__8__** supply. It is also a major **__9__** destination, with some seven million **__10__** a year, almost one million of whom go on tours through the dam.

Cultural insights

Herbert Clark Hoover (August 10, 1874 – October 20, 1964) was an American politician and engineer who served as the 31st president of the United States from 1929 to 1933 and a member of the Republican Party.

2. Answer the questions thoroughly/ Tick the right answer

1.

2.

3.

4.

5.

The Hoover Dam is a **large** dam on the Colorado River. It is on the border of the states of Arizona and Nevada. The **__3__** it made is called Lake Mead. The dam is named after the former US President Herbert Hoover. At first it was called "Boulder Dam", but the name was changed to honor Hoover, who was president when the idea of **__4__** the dam started. The dam is used for **__5__** and silt control, hydroelectric **__6__**, agricultural **__7__**, and domestic **__8__** supply. It is also a major **__9__** destination, with some seven million **__10__** a year, almost one million of whom go on tours through the dam.

Appendix 6: Treatment Lesson N° 02

Lesson Two: Socializing

Outcomes: *Upon the completion of this lesson, you will be able to*:

1. Identify to have

2. Use to have in declarative sentences

3. Use to have in negative sentences

4. Use to have in interrogative sentences

Dialogue 1 At the Cafeteria

After lunch, Prof. BSO, Prof. Waters, Prof. Benomar and Dr. MacMaster are at the cafeteria.

Prof. BSO (to all): Have a seat, please.

Prof. Waters, Prof. Benomar and Dr. MacMaster in chorus: Thanks.

Prof. BSO: These chairs are comfortable, aren't they?

Prof. Waters: They are. I have something for you both. This perfume Nina Ricci *Premier Jour* for Prof. Benomar. And I have this **MeisterSinger** watch for Prof. Bashir.

Prof. Benomar: Thank you ever so much. I don't have words to thank you.

Prof. BSO: That watch has everything: beauty, elegance, and accuracy. Thank you very much indeed.

Prof. Waters: You are most welcome both of you.

Dr. MacMaster: I do have something for you two as well. **These earrings** are of course for Prof. Benomar. there you go. And for Prof. Bashir, I have this **necktie**.

Prof. Benomar: That is very kind of you indeed.

Prof. BSO: Thanks a lot. We, too, have nice presents for you. They are for the last day of the conference.

Difficult words

MeisterSinger: brand of watch (German one)

Nina Ricci Premier Jour: Brand of perfume (Italian one)

Dialogue *2:* *Small talk at the cafeteria*

Prof. BSO: Waiter, please.

Waiter: Yes, sir.

Prof. Waters: Coffee for me.

Dr. MacMaster: Tea is my favorite drink. I'll have a nice cup of **mint tea.**

Prof. Benomar: **Orange juice** for me, please.

Prof. BSO: An espresso for me. Thanks

Professor Waters has a picture with him.

Prof. Waters: Here is my family. This is my wife, Dora. She has three cats and a dog. These are my twin daughters: Emily, 18. She is a student at Princeton. And this little one is Lyla. She is 12. She has all kinds of electronic gadgets. She is **a nerd**. We have a large house with three bathrooms and two SUV cars.

Prof. Benomar: It is a small family by Algerian **standards**. We have large families.

Prof. BSO: True. I have six children. I have four daughters and two boys.

Prof. Benomar: I have six brothers and ...

Dr. MacMaster: Have you any sisters, at all?

Prof. Benomar: No such luck. I don't have any. And you? Have you any **siblings** or children?

Dr. MacMaster: I don't have children. I am still single. My *fiancé* is in the Army. I have one brother, though. He has three kids. Two nieces and a nephew.

Mint tea= tea with mint (la menthe).

A nerd = the one who always revise his lessons

Difficult words

Standards : norms

Siblings: Brothers and sisters

Dialogue 3 *Talking about the conference topics.*

Prof. BSO: I have your abstract. It is very interesting. It has many good points.

Prof. Waters: I am happy you are interested in my study. We have similar geological formations and water shortage as in your regions. Do you have other forms of irrigation other than those you mentioned in your emails?

Prof. BSO: We have. They are still undergoing experimentation. We don't have enough financial resources to undertake other projects. We have other challenges, too.

Prof. Benomar: And what about you Dr. MacMaster? Do you have any bright ideas for us?

Dr. MacMaster: Well, I have indeed. I am interested in growing plants in chemical solutions. These solutions are based on recycling sewage waters.

Prof. Benomar: Great. We have so much to learn from your research.

Prof. Waters: Insha Allah!

Everybody laughs.

Difficult words

Recycling = the reuse of something **Sewage:** wastewater = water after its use

Reading comprehension texts

Text One

The foggara is an **ingenious** traditional technique of groundwater exploitation used to supply domestic and agricultural water to communities in arid areas. In Algeria's Adrar Province, foggaras have for centuries provided a **sustainable** supply of water and played an important role in sustaining the **livelihoods** of local populations in a **hyper-arid** environment. In order to preserve this important source of water that can also be considered a piece of national **heritage**, Algeria's National Agency of Hydraulic Resources has started inventorying the region's foggaras, and collecting information about their state, location, and productivity into a **GIS** database.

Difficult words

Ingenious: inventive

S**ustainable:** it lasts a long time

Livelihoods: ways to live or survive.

Hyper-arid: highly arid

Heritage: Patrimony

GIS: acronym of Geographical information system

Global Comprehension

1. What is foggara?

2. In which province of Algeria does foggara exist?

3. What have foggaras provided in Adrar province?

Detailed Comprehension

1. For what reason is foggara used for?

2. Which role have foggaras played?

3. What has Algeria's National Agency of Hydraulic Resources started to do to preserve foggara?

Lexis:

Synonyms: *Find in the text words closest in meaning to the following*

a. State = b. Conserve = c. Desert =

Antonyms: *Find in the text words opposite in meaning to the following*

a. Lazy ≠ b. Modern ≠ c. Wet ≠

Grammar

*Pick out from dialogue 3 three sentences in which the verb to have is used in declarative, negative, and interrogative form.

……

……

……

* Make three sentences in which the verb to have is used in declarative, negative, and interrogative form using your own words.

……

……

……

Text Two*: Read the text then fill in the text from words in the box*

stored- billions –built – developed - irrigation- lowest- water- created- flood-rivers

Text two

The most important element in any irrigation system is a dependable ……..……. supply. Most of the world's major irrigation systems receive water from great …….. that have their tributaries in snow-clad or rain-swept mountains. Among these rivers are the Nile in Egypt, the Huang He (Yellow River) in China, and the Colorado, Columbia, and Missouri in the United States. Groundwater from deep wells is also used for ……. especially in desert countries such as Algeria, Kuwait, and Saudi Arabia.

Generally the need for irrigation water is highest in the dry season when river flows are ……To ensure continuous supply, water must be …….. on a seasonal and sometimes annual basis. By erecting a dam, an artificial lake, or reservoir, is ……..from which water can be released as required. Some reservoirs are capable of storing ……of gallons of water. Large dams and the associated reservoirs are often …….. for multipurpose use—irrigation, ……. control, hydroelectric power generation, municipal and industrial water supply, and recreation. Systems of dams and reservoirs along a river and its tributaries are ……with the purpose of providing comprehensive and integrated water resources management in an entire basin.

Difficult words

Tributaries = stream flowing into a larger river or lake

Erecting = constructing

Snow-clad = Covered by snow

Rain-swept= exposed to rain and wind.

Municipal water = water used for cities (human use and consumption)

Text two

The most important element in any irrigation system is a dependable water supply. Most of the world's major irrigation systems receive water from great rivers that have their tributaries in snow-clad or rain-swept mountains. Among these rivers are the Nile in Egypt, the Huang He (Yellow River) in China, and the Colorado, Columbia, and Missouri in the United States.

Groundwater from deep wells is also used for irrigation, especially in desert countries such as Algeria, Kuwait, and Saudi Arabia.

Generally the need for irrigation water is highest in the dry season when river flows are lowest. To ensure continuous supply, water must be stored on a seasonal and sometimes annual basis. By erecting a dam, an artificial lake, or reservoir, is created from which water can be released as required. Some reservoirs are capable of storing billions of gallons of water. Large dams and the associated reservoirs are often built for multipurpose use—irrigation, flood control, hydroelectric power generation, municipal and industrial water supply, and recreation. Systems of dams and reservoirs along a river and its tributaries are developed with the purpose of providing comprehensive and integrated water resources management in an entire basin.

Appendix 7: Treatment Lesson N° 04

Lesson Three: *About the Conference*

Outcomes: *By the completion of this lesson, you will be able to*:

1. to identify verbs (regular and irregular)

2. to point out to the uses of the present simple

3. to inquire using wh-and aux-questions

4. to negate verbs in the present simple

5. to use adverbs of time

Grammar Items

stem+s (he/ she/it)

stem+0 (I/you/we/they)

Wh-word+ do/ does+ subj+stem+c/o?

Subj+ don't/ doesn't+ stem+o/c?

's (Dr. MacMaster's paper/ abstract)

Lexis

Actually/ as matter of fact/ indeed

Usually/ often/ never/ rarely

Sewage/ sludge/ biofuel/ cost-effective/

Great!

Eager to do something

Dialogue 1

Prof. Waters, Dr. MacMaster, and Prof. BSO and Prof. Benomar are in the office of Prof. Mansour Lekbir, the Head of the Scientific Committee of the Conference.

Prof. Lekbir: Prof. Waters, Dr. MacMaster, dear Colleagues BSO and Benomar, come in please. You are most welcome in my office. Please, take seats.

Prof. Waters: On my behalf and on Dr. MacMaster, I thank you very much for the warm welcome.

Prof. Lekbir: What do you expect about hospitality? Hospitality is still *de rigueur* in these parts, my dear colleagues. Let's get down to business, shall we? I have here your abstract and Dr. MacMaster's. They are truly interesting. I read here in your abstract you discuss energy recovery at U.S. wastewater treatment plants (WWTP). Can you further detail your thoughts, please?

Prof. Waters: All right. Thanks for your interest. Actually, I investigate opportunities to improve energy recovery at U.S. wastewater treatment plants (WWTP). My research aims to transform underutilized municipal wastewater solids into a renewable, cost-effective feedstock for biocrude production. The latter is a precursor for liquid transportation biofuels. Wastewater treatment facilities can substantially improve energy recovery efficiency and reduce disposal costs by leveraging existing feedstock collection, storage, formatting, and effluent treatment infra-structure for transportation biofuels production.

Prof. Lekbir: How interesting! That is good for the economy and environment, doesn't it? Do you think Algerian Government and other Third World countries can undertake such innovative procedures with the help of the U.S. Government?

Prof. Waters: I don't think this is a problem. Investment from both governments leads to more international cooperation. The U.S. Department of Agriculture promises help.

Prof. Lekbir: Cooperation is what we need, indeed. Thank you, Prof. Waters. Meet you in the Conference theater in 15 minutes. Prof. BSO is going to show you the way to the theater. Good luck

Dialogue 2

As Prof. Waters and Prof. BSO leave the office, Prof. Benomar introduces Dr. MacMaster's work to Prof. Lekbir.

Prof. Benomar: As for Dr. MacMaster's presentation, I find it really interesting as far as I am concerned. Dr. MacMaster concerns herself with turning sewage waters at a low cost into drinkable waters for humans, animals, and irrigation. As you know this is my area of expertise.

Prof. Lekbir: I am interested as well with the global warming and world population growth- 8 billion for the record- a great deal of fresh water must be available for all. I am all ears Dr. MacMaster.

Dr. MacMaster: Actually, I often ask myself "Do wastewater have to be wasted?" and " What do scientist need to do about that particularly in arid and semi-arid areas?" My research reveals that the nutrients and organic matter in treated sludge resembles those in other organic waste-based soil amendments such as animal manure and organic composts. The use of sludge as a soil conditioner serves to improve soil physical properties in a manner similar to other organic-based soil amendments.

Prof. Lekbir: Great! That is exactly what we need here. Does the treatment cost a lot?

Dr. MacMaster: As a matter of fact, it does not. All you need is good management of human and financial resources. Usually, deficiency in good management increases costs. "Good management never lets you down" that is my motto.

Prof. Lekbir: I feel happy that Prof. Waters and yourself present today. I expect a lot of questions. Do you feel ready to take very many questions and answer all of them?

Dr. MacMaster: I do and eager to get started.

Prof. Benomar: On we go then.

Prof. Lekbir: I wish you good luck everyone.

Dialogue 3

Prof. Lekbir is on the phone with the Rector. He often calls the rector to inform him after important meetings

Prof. Lekbir: Hello, sir. I'd like you to know that I am optimistic. Presentations are rich and evidence based.

The Rector: Happy to hear that. How many presentations do you intend to attend?

Prof. Lekbir: All sir. That means 7. Presenters belong to 3 different nationalities: Algerian, American, and French. I always encourage different perspectives. I expect a hot debate. This Conference will be talked of, I guarantee you that, sir. I rarely get things wrong. Do you have your inaugural speech ready?
The rector: Yes, I do. And in three languages! Let's meet at the Conference theater. It is about time.

Prof. Lekbir: All right, sir. Please, don't forget to thank the U.S. Department of Agriculture for sponsoring the Conference.

The Rector: I never forget generous and cooperative sponsors. And they are.

Reading Texts

Text One

Biofuel is any fuel that is derived from biomass, plant, algae material or animal waste. Since such feedstock material can be replenished readily, biofuel is considered to be a source of renewable energy, unlike fossil fuels such as petroleum, coal, and natural gas. Biofuel is commonly advocated as a cost-effective and environmentally benign alternative to petroleum and other fossil fuels, particularly within the context of rising petroleum prices and increased concern over the contributions made by fossil fuels to global warming. Many critics express concerns about the scope of the expansion of certain biofuels because of the economic and environmental costs associated with the refining process and the potential removal of vast areas of arable land from food production.

Biofuel = something gives energy

Fossil = organic remains from previous time

Benign = Kindly

Feedstock = raw material for processing or manufacturing industry.

Arable land = farmable land = agricultural soil

Global Comprehension

1. What is biofuel?

2. What are fossil fuels?

3. Are fossil fuels economic?

Detailed Comprehension

1. From which materials is biofuel derived?

2. What are the drawbacks of fossil fuels?

3. What are the advantages of biofuels?

Lexis:

Synonyms: *Find in the text words closest in meaning to the following*

a. Cost-effective = b. Sewage= c. Replenish = Supply

Antonyms: *Find in the text words opposite in meaning to the following*

a. Benign ≠ unfriendly b. Renewable ≠ unsustainable c. Expansion≠ Reduction

Grammar

*Pick out from dialogue 1, 2, 3, three sentences (for each form) in which a verb in present tense is used in declarative, negative, and interrogative form.

……

……

……

*Make three sentences in which a verb in present tense is used in declarative, negative, and interrogative form using your own words.

……

……

*Pick out from dialogue 1, 2, and 3, five adverbs of time.

……

*Pick out from dialogue 1, 2, and 3, three Wh interrogative sentences and three auxiliary interrogative sentences

……

Text Two*: Read the text then fill in the gaps from words in the box*

Disguise, correctly, biological, land, biosolids, solids, recently reduction, raw, industrial

The term "biosolids" has been introduced by the wastewater treatment industry. The industry defines as sewage sludge that has undergone sufficient treatment for stabilization and pathogen , and that is of sufficiently high quality to be land applied. The term is intended to distinguish high-quality, treated sewage sludge from sewage sludge and from sewage sludge that contains large quantities of environmental pollutants. The term "biosolids" also helps to distinguish sewage sludge from sludge by emphasizing that the former is produced by a process. The term has been criticized by some as an attempt to the real nature of sewage sludge, thereby making land application of this material less objectionable to the general public. Although "biosolids" undoubtedly does not conjure up the same negative

images as does "sewage sludge" or simply "sludge," it is a legitimate and functional term when

used to make the distinction described above. In this document, "sewage sludge" will be used to refer to wastewater treatment generally, and "biosolids" will be used to refer specifically to material that is suitable for

application.

Important note

We have many types of time's adverbs:

- Adverbs that tell as when : today, now, tomorrow, later, last year, yesterday. They are usually placed at the end of the sentence.
- Adverbs that tell as how long: all day, for a year (a week, three days, since 1980 (since Friday, …). They are usually placed at the end of the sentence.
- Adverbs that tell as how often (express the frequency): always, often, usually, sometimes, seldom, rarely, never. They are usually placed before the main verb but after auxiliary verbs *(such as* be, have, may, & must).

Practice:

Transform these declarative sentences into negative ones. Ask auxiliary and Wh question for each sentence.

1- The research aims to transform municipal wastewater solids into a renewable, cost-effective biofuels.

2- Wastewater treatment facilities often improve energy recovery efficiency.

3- The industry defines biosolids as high-quality, stabilized sewage sludge.

4- Heavy metals and pathogen need to be reduced as possible as it is.

5- The use of sludge as a soil conditioner serves to improve soil physical properties.

Text 2

The term "biosolids" **recently** has been introduced by the wastewater treatment industry. The industry defines **biosolids** as sewage sludge that has undergone sufficient treatment for stabilization and pathogen **reduction,** and that is of sufficiently high quality to be land applied. The term is intended to distinguish high-quality, treated sewage sludge from **raw** sewage sludge and from sewage sludge that contains large quantities of environmental pollutants. The term "biosolids" also helps to distinguish sewage sludge from **industrial** sludge by emphasizing that the former is produced by a **biological** process. The term has been criticized by some as an attempt to **disguise** the real nature of sewage sludge, thereby making land application of this material less objectionable to the general public. Although "biosolids" undoubtedly does not conjure up the same negative images as does "sewage sludge" or simply "sludge," it is a legitimate and functional term when **correctly** used to make the distinction described above. In this document, "sewage sludge" will be used to refer to wastewater treatment **solids** generally, and "biosolids" will be used to refer specifically to material that is suitable for **land** application.

Appendix 8: Treatment Lesson N° 04

Lesson Four: *At the Conference (Opening)*

Outcomes: By the completion of this lesson, you will be able to:

1. identify the present continuous;

2. point out to is morphology and uses

3. utilize it in interrogative and negative statement

Grammar

to be {am/ is/are} + stem-ing

Lexis

vocabulary related to conferences:

keynote speaker- presentation- sustainable energy- renewable energy-inaugural address-

Dialogue 1 Collecting Prof. Waters and Dr. MacMaster at the Ziban Hotel

Reception is dialing the phone number of Prof. Waters' room

Reception: Hullo! Good morning Prof. Waters. Prof. Benomar is waiting for you at the Reception Desk. Are you coming down?

Prof. Waters: Good morning. Please tell Prof. Benomar I am coming down right away.

Receptionist: All right. I am going to deliver the message. What are you having for breakfast?

Prof. Waters: Aren't you offering a self-service?

Receptionist: For our special guests, we take their orders.

Prof. Waters: In that case, I am ordering for Dr. MacMaster and myself. We will be having eggs, toasted bread, butter, marmalade, cornflakes, orange juice, Algerian pancakes.

Receptionist: Algerian pancakes?! Sorry, Prof. Waters. I am not following!

Prof. Waters: Oh, sorry. I am reading on my smatphone, you call them "Gheraif" or "Beghreer".

Receptionist: All right.

Dialogue 2 By Prof. Benomar's car.

Prof. Benomar, Prof. Waters, and Dr. MacMaster are talking by Prof. Benomar's car in the Ziban Hotel courtyard.

Prof. Benomar: Good morning Prof. Waters. Good morning Dr. MacMaster.

Dr. MacMaster: Good morning, Prof. Benomar. It is going to be a long day.

Prof. Waters: Hi there! Great to see you again.

Prof. Benomar: The Rector is expecting you at the Guests Hall. He is insisting on presenting you to the audience. Let's get going.

Dr. MacMaster: I feel you are planning something special in our honor.

Prof. Benomar: It is quite a hunch you got there. In fact, you are going to be met with knight on horses. They are going to clothe you with traditional *Qashabiya* and fire shots from their *Qarabila*.

Prof. Waters: I am not missing this for the World.

Dialogue 3: The official opening of the conference.

The Rector is delivering the inaugural address .

The Rector: Essalamo Aleikom. Good morning everyone. Welcome to this international conference. On behalf of all the teachers, I welcome Prof. Waters and Dr. Waters. They are our special guests from the *States*[1]. They are going to be our keynote speakers. I am officially opening this scientific event. I am not leaving the theater until I hear all the presentations. Now, I am inviting Prof. waters to come to the podium to deliver his keynote speech.

Prof. Waters: Thank you, Prof. Riyad Biskri for the warm welcome and hospitality. I am hoping that this Conference adds to our understanding and cooperation in these uncertain times. As you know, our planet is facing many challenges. Are we going to sit around and watch? The world population is growing. Food shortage is being felt. crops are failing because of rain shortage or lack of the right pesticides and fertilizers. contaminated waters are being wasted. Again, What are we going to do. My presentation is going to try answer these questions.

Text Reading

People often use the terms “sustainable” and “renewable” interchangeably. However, there is a difference between the two: the possibility of replenishment. **Sustainable energy**, as highlighted above, is theoretically inexhaustible. It cannot be depleted because sustainable energy sources don’t need to be replenished. For example, think of the sun or wind. Neither resource needs to be created or replaced.

On the other hand, **renewable energy** is theoretically exhaustible — it uses resources from the earth that can naturally be replenished, such as crops and biomatter. A renewable energy source like bioenergy uses biological masses (e.g. agricultural byproducts like straw and manure) to create energy. Another example of bioenergy is ethanol, which is made from sugarcane and corn. Since these crops can be planted and farmed to generate more energy, it’s a type of renewable energy.

Sustainable = continual = continuous Replenished = replaced = supplied

Renewable= to be replenished or revived

Global Comprehension

1. What are the terms often used interchangeably?

[1] In America, it is often to hear Americans calling the United States of America as THE STATES.

2. Why is bioenergy considered renewable energy?

3. From what material is ethanol made?

Detailed Comprehension

1. Why can sustainable energy not be depleted?

2. Why is bioenergy renewable energy and unsustainable one?

3. Why are the sun and wind sustainable energy and not renewable one?

3. **Lexis:**

Synonyms: *Find in the text words closest in meaning to the following*

a. Consumed = b. Endless = c. Produce =

Antonyms: *Find in the text words opposite in meaning to the following*

a. Limited = b. Depleted =

Grammar

*In, In which tenses are the verbs conjugated? Why?

……

……

*Pick out from the dialogues 1, 2, and 3, three sentences in which a verb is conjugated in present continuous used in declarative, negative, and interrogative.

……

……

*Make three sentences in which a verb is conjugated in present continuous used in declarative, negative, and interrogative form using your own words.

……

Text Two*: Read the text then fill in the gaps from words in the box*

Assess recovery sludge utilized cost-effective converts

U.S. municipal wastewater contains approximately 160 trillion Btu/y of influent chemical energy, but very little is recovered and **utilized** nationwide. Hydrothermal liquefaction (HTL) is a thermochemical process that **converts** biomass into a biocrude intermediate that can be upgraded to a variety of liquid fuels. HTL provides an opportunity to enhance energy **recovery** at wastewater treatment plants by transforming underutilized municipal wastewater solids into a renewable, **cost-effective** feedstock for transportation biofuels. In this study, we estimate total national economic sludge feedstock supply by performing discounted cash flow analyses at >15,000 U.S. wastewater treatment facilities to **assess** the net present value of 30-year HTL investments, with comparison to wider adoption of anaerobic digestion (AD).

Appendix 9: Post-test

Faculty of Sciences and Technology **2022/2023**
Department of Civil Engineering and Hydraulics. **Student name:**
Course: Technical English **Level:**
Levels: 1(L+2L) FN **Group:**
Time Allotted: 1h.30

First term Examination

In recent years, dry agricultural land application of municipal biosolids has increased and is projected to continue increasing. Approximately 3 to 4 million megagrams of biosolids are applied on agricultural land in the United States. Over one half of all municipal sewage generated in the United States is applied on land for beneficial use. From the municipalities' point of view, applying biosolids to agricultural land represents a relatively safe method to recycle biosolids. From the farmers' point of view, it becomes a resource used to supply nutrients and organic matter. However, potential environmental hazards exist since biosolids could contain trace metals. These and other environmental concerns have prompted the USEPA to establish risk-based regulations for the use of biosolids. Excessive application of biosolids may lead to NO3–N leaching through the soil profile and into the groundwater.

A/ Comprehension:

1-Circle the letter that corresponds to the right answer:

- The text is about: a/agriculture b/biosolids c/ sewage
- The author is with the use of biosolids in agriculture. : a/ yes b/no c/debatable

2- Are these statements True or False according to the text? (put T or F):

- The use of biosolids in agriculture has increased recently.
- Less than 3 million dry megagrams of biosolids are applied to agricultural land in the United States.
- The municipalities are against the application of biosolids to agricultural land.
- The farmers support the use of biosolids in agricultural matters.

3- Answer the following questions according to the text

- Why do municipalities agree to biosolids use in agriculture ?

……

……

- For what reasons do the farmers support applying biosolids to agricultural land?

……

……

- Why has the USEPA been prompted to establish risk-based regulations for the use of biosolids ?

……

……

B- Text exploration

1)-Find in the text words that are closest in meaning to the following:

a/sewage sludge = ……. b/ replenish =……..

2)- 2. Find in the text words that opposite in meaning to the following:

a. Harmful =/= ..... b. diluting =/= .....

3)-Give the correct forms of the verbs in brackets.

My research (reveal)……that the nutrients and organic matter in treated sludge (resemble) ……those in other organic waste-based soil amendments. The sludge (have) …….been used as a soil conditioner. The sludge treatment (cost) ……not a lot. Usually, poor management strategies (be) ……the reasons of costs increasing.

4) – Ask auxiliary questions and Wh questions for the following sentences:

1/ The use of biosolids in agriculture has increased recently.

- …….....
- ……

2/ Applying biosolids to agricultural land represents a relatively safe method to recycle biosolids.

- ……
- ……

5)- Fill in the gaps with the words from the list:

Promote - clarifier - transported – clean – disposal - settle out

The core task of a wastewater treatment plant (WWTP) is to domestic wastewater before reuse or . Treatment is separated into primary treatment and

secondary treatment. Primary treatment has wastewater continuously pass through a , or settling tank, to settle out solids, or primary sludge. In secondary treatment, wastewater is aerated in a basin to microbial growth. These microbes form flocs and as activated or secondary sludge. The combined biosolids must be treated on-site or to another facility for treatment and disposal.

C/Paragraph Writing (Jumbled Sentences): Re-order these jumbled statements to make a coherent paragraph**.**

a)-In 2008, c.77% of UK sludge production was recycled to farmland as biosolids.

b)-However, thermal technologies drying, has produced new enhanced treated biosolids products compared with conventional digested sludge cake products

c)-Biosolids provide a valuable source of plant available nutrients and organic matter that can be of benefit to soil quality and fertility.

d)- Thermally dried biosolids have a number of advantages compared with conventionally treated products, viz.: the volume of material to be transported is reduced and the material can be pelletised.

e)-The application of biosolids (i.e. treated sewage sludge) to agricultural land is regarded as the Best practicable environmental option in most circumstances.

f)-Digested cake is the most common biosolids product applied to farmland.

Best of luck

Pr.Ounoki

Appendix 10: Syllabuses of teaching English in Hydraulics division

Hydraulisc English syllabus (S3+S4)

Semestre :3

Intitulé de la matière : Langue étrangère

Crédit 1

Objectifs de l'enseignement :

. - Amélioration des capacités linguistiques

- Promptitude à la rédaction de rapports

Connaissances préalables recommandées :

-Bases élémentaire en langue vivante

Contenu de la matière :

Unite1 : Civil Engineering

- Text reading
- Terminology explanation
- Check-up
- Elements of Grammar : 8 parts of speech
- Listening skill

Unit 2 : Dam

- Text reading
- Terminology explanation
- Check-up
- Elements of Grammar : Sentence patterns
- Listening skill

Unit 3 : Water resources

- Text reading
- Terminology explanation
- Check-up
- Elements of Grammar : Sentence patterns
- Listening skill

Mode d'évaluation : Contrôle Continu

Semestre :4

Crédit 1

Intitulé de la matière Langue Etrangère

Contenu de la matière :

Unit 1 : Water supply

- Text reading
- Terminology explanation
- Check-up
- Elements of Grammar : Verb tenses
- Listening skill

Unit 2 : pumps

- Text reading
- Terminology explanation
- Check-up
- Elements of Grammar : How to write a paragraph?
- 1Listening skill

Unit 3 : Basic Equations of Hydraulics

- Text reading
- Terminology explanation
- Check-up
- Elements of Grammar: How to write an essay?
- Listening skill

1L(Sciences of technology)

Semestre: 1

Unité d'enseignement: UET 1.1

Matière 1: Langue Anglaise1

VHS: 22h30 (Cours: 1h30)

Crédit: 1

Coefficient: 1

Objective:

Develop the reading, writing, listening and speaking abilities of the students.

Recommended prior Knowledge:

Basic English.

Contents:

The English syllabus consists of a set of texts containing scientific and technical parts. The chosen texts must be used to study scientific and technical English and Grammar acquisition.

The texts must be selected according to the vocabulary built up, familiarization with both scientific and technical matters in English for further understanding. Therefore, each text will be defined by a set of vocabulary concepts, a set of special sentences (idioms) and comprehension questions.

The texts must contain also a terminology which means the translation of some words from English to French one. Besides, the activity at the end of each session must include a translation of long statements which are selected from the texts.

Examples for some lectures:	Examples of Word Study: Patterns
Iron and Steel	Make + Noun + Adjective
Heat Treatment of Steel.	Quantity, Contents
Lubrication of Bearings.	Enable, Allow, Make, etc. + Infinitive
The Lathe.	Comparative, Maximum and Minimum
Welding.	The Use of Will, Can and May
Steam Boilers.	Prevention, Protection, etc., Classification
Steam Locomotives.	The Impersonal Passive
Condensation and Condensers.	Passive Verb + By + Noun (agent)
Centrifugal Governors.	Too Much or Too Little
Impulse Turbines.	Instructions (Imperative)
The Petro Engine.	Requirements and Necessity
The Carburation System.	Means (by + Noun or –ing)
The Jet Engine.	Time Statements
The Turbo-Prop Engine.	Function, Duty
Aerofoil.	Alternatives

Evaluation mode:

Exam : 100%.

1L (Sciences of technology)

Semestre: 2

Unité d'enseignement: UET 1.2

Matière 1: Langue Anglaise 2

VHS: 22h30 (Cours: 1h30)

Crédits: 1

Coefficient: 1

Objective:

Develop the reading, writing, listening and speaking abilities of the students.

Recommended prior Knowledge:

Basic English.

Contents:

The English syllabus consists of a set of texts containing scientific and technical parts. The chosen texts must be used to study scientific and technical English and Grammar acquisition.

The texts must be selected according to the vocabulary built up, familiarization with both scientific and technical matters in English for further understanding. Therefore, each text will be defined by a set of vocabulary concepts, a set of special sentences (idioms) and comprehension questions.

The texts must contain also a terminology which means the translation of some words from English to French one. Besides, the activity at the end of each session must include a translation of long statements which are selected from the texts.

Examples for some lectures:	Examples of Word Study: Patterns
Radioactivity.	Explanation of Cause
Chain Reaction.	Result
Reactor Cooling System.	Conditions (if), Conditions (Restrictive)
Conductor and Conductivity.	Eventuality
Induction Motors.	Manner
Electrolysis.	When, Once, If, etc. + Past Participle
Liquid Flow and Metering.	It is + Adjective + to
Liquid Pumps.	As
Petroleum.	It is + Adjective or Verb + that…
Road Foundations.	Similarity, Difference
Rigid Pavements.	In Spite of, Although
Piles for Foundations.	Formation of Adjectives
Suspension Bridges.	Phrasal Verbs

Evaluation mode:

Exam : 100%.

2L (GC+Hyd+TP)(S3)

Semestre: 3

Unité d'enseignement: UET 2.1

Matière 1: Anglais technique

VHS: 22h30 (Cours: 1h30)

Crédits: 1

Coefficient: 1

Objectifs de l'enseignement

Ce cours doit permettre à l'étudiant d'avoir un niveau de langue ou il pourra utiliser un document scientifique et parler de sa spécialité et filière dans un anglais du moins avec aisance et clarté.

Connaissances préalables recommandées

Anglais 1 et Anglais 2

Contenu de la matière

- Compréhension et expression orales, acquisition de vocabulaire, grammaire...etc.

- les noms et adjectifs, les comparatifs, suivre et donner des instructions, identifier les choses.

- Utilisation de nombres, symboles, équations.
- Mesures: Longueur, surface, volume, puissance ...etc.
- Décrire les expériences scientifiques.

- Caractéristiques des textes scientifiques.

Mode d'évaluation :

Examen final: 100 %.

Références bibliographiques:

(Selon la disponibilité de la documentation au niveau de l'établissement, Sites internet...etc.)

Master One Hydraulics (HU+OH)

Semestre: 1

Unité d'enseignement: UET 1.1

Matière 1: Anglais technique et terminologie

VHS: 22h30 (Cours: 1h30)

Crédits: 1

Coefficient: 1

Objectifs de l'enseignement:

Initier l'étudiant au vocabulaire technique. Renforcer ses connaissances de la langue. L'aider à comprendre et à synthétiser un document technique. Lui permettre de comprendre une conversation en anglais tenue dans un cadre scientifique.

Connaissances préalables recommandées:

Vocabulaire et grammaire de base en anglais

Contenu de la matière:

- Compréhension écrite : Lecture et analyse de textes relatifs à la spécialité.

- Compréhension orale : A partir de documents vidéo authentiques de vulgarisation scientifiques, prise de notes, résumé et présentation du document.

- Expression orale : Exposé d'un sujet scientifique ou technique, élaboration et échange de messages oraux (idées et données), Communication téléphonique, Expression gestuelle.

- Expression écrite : Extraction des idées d'un document scientifique, Ecriture d'un message scientifique, Echange d'information par écrit, rédaction de CV, lettres de demandes de stages ou d'emplois.

Recommandation :Il est vivement recommandé au responsable de la matière de présenter et expliquer à la fin de chaque séance (au plus) une dizaine de mots techniques de la spécialité dans les trois langues (si possible) anglais, français et arabe.

Mode d'évaluation:

Examen: 100%.

Résumé

L'anglais sur objectifs spécifiques (ESP) s'est imposé comme l'une des approches les plus influentes aux niveaux académique et professionnel. ESP fournit un enseignement pertinent si le cours est bien conçu et prend en compte toutes les fonctionnalités requises. L'enseignement et l'apprentissage de l'ESP dans le département d'hydraulique du département de génie civil et d'hydraulique de l'Université de Biskra rencontre un nombre de problèmes pour plusieurs raisons, telles que l'absence d'un programme d'ESP adapté, le temps limité alloué et l'insuffisance des matériaux de l'enseignement. Sur ce fait, la présente recherche a étudié et évalué le programme ESP intuitif, actuel de l'hydraulique et l'efficacité du programme complet, expérimental repensé. La population d'intérêt était les étudiants de premier cycle en hydraulique à l'Université Mohamed Khider de Biksra. Une étude quasi-expérimentale était le choix rationnel pour tester au mieux les hypothèses de la recherche. Les instruments d'analyse des besoins par le biais de questionnaires, de traitements et de tests ont été utilisés pour la collecte de données. Les résultats consolidés, après analyse et interprétation, ont démontré l'efficacité du syllabus complet ESP repensé. Les étudiants participants ont fait preuve de motivation envers la diversité des tâches et l'interactivité apparente en classe. En conséquence, l'adoption et l'adaptation du syllabus complet d'hydraulique ESP repensé sont recommandées dans les domaines techniques.

Mots clés : **ESP, Hydraulique, Domaines techniques, syllabus.**