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**Improving ESP Teacher Professional Development for Online
Pedagogy in Algerian Higher Education**

*Thesis Submitted to the Department of English in Candidacy for the Degree of Doctorate
in Didactics.*

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DECLARATION OF ORIGINALITY

I, the undersigned, declare that this thesis is my original work, and has not been presented in fulfilment of other course requirements at any university.

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DEDICATIONS

To the One who guides all paths

First and foremost, I dedicate this work to Allah, whose mercy, strength, and wisdom sustained me through every step of this journey.

To my beloved mother, Rebeia Menaceur

Your unconditional love, endless prayers, and sacrifices—spoken and silent—have been the heartbeat behind this accomplishment. This is as much yours as it is mine.

To my dear brothers,

For your patience when I was absent in presence, your encouragement when doubt crept in, and your constant reminder of who I am and what I can be.

To every teacher and mentor who lit a spark in my mind and soul

This thesis carries traces of your inspiration.

And finally,

To my future wife

Thank you for your patience, wherever you are. I had to finish this journey before finding you.

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ABSTRACT

In Algerian higher education, English for Specific Purposes (ESP) is increasingly recognized as a core component in supporting students' academic and professional success. Following the outbreak of the COVID-19 pandemic, the shift to online learning revealed significant gaps in ESP teachers' preparedness to deliver instruction in digital environments. This study investigates the professional development of ESP teachers with a focus on enhancing their competencies in online pedagogy. Using an action research design with a mixed-methods approach, the study engaged a sample of eight ESP teachers in a three-phase intervention comprising an initial needs analysis, pre-training classroom observations, an online training programme, and post-training classroom observations. Four research instruments were used in the study, a needs analysis questionnaire, pre-training and post-training observation grids, the online training intervention, and a post-training feedback questionnaire. Data generated through these instruments were analysed using descriptive statistics and qualitative content analysis. The findings demonstrate that the training enhanced teachers' digital proficiency, use of online pedagogical strategies, and classroom engagement techniques in virtual settings. The study further suggests that integrating structured action research cycles, promoting reflective practice, and fostering communities of practice can help sustain ESP teachers' development in online teaching. These findings underline the need for continuous, context-sensitive professional development to ensure quality ESP instruction in Algeria's evolving digital education landscape.

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LIST OF ABBREVIATION AND ACRONYMS

AR: Action Research

CoPs: Communities of Practice

COVID-19: Coronavirus Disease 2019

EAP: English for Academic Purposes

ELT: English Language Teaching

EMI: English as a Medium of Instruction

EOP: English for Occupational Purposes

ESP: English for Specific Purposes

GE: General English

GELT: General English Language Teaching

HEIs: Higher Education Institutions

ICT: Information and Communication Technology

LMS: Learning Management System

MOHE: Ministry of Higher Education

MESRS: Ministère de l'Enseignement Supérieur et de la Recherche Scientifique

OECD: Organisation for Economic Co-operation and Development

PD: Professional Development

PSA: Present Situation Analysis

SLA: Second Language Acquisition

TPACK: Technological Pedagogical Content Knowledge

TSA: Target Situation Analysis

GENERAL

INTRODUCTION

GENERAL INTRODUCTION

The growing importance of English as an international language has reshaped education, research, and professional communication across the world. Within this context, English for Specific Purposes (ESP) has become an important area of language teaching because it responds to the academic and professional needs of learners in specialized disciplines. As ESP continues to expand in higher education, the professional development of ESP teachers has become increasingly important, particularly in contexts where teaching demands are changing rapidly.

One of the most significant recent changes in education was the rapid shift to online learning during the COVID-19 pandemic. In Algeria, as in many other countries, this transition exposed important weaknesses in teachers' preparedness for digital teaching. Although many teachers had experience in face-to-face instruction, they were often not adequately prepared to teach in online environments. This challenge was particularly evident in ESP, where teachers are expected not only to teach language, but also to address discipline-specific communication needs in meaningful and context-sensitive ways.

The Algerian higher education context makes this issue especially significant. In recent years, English has gained increasing importance in national educational policy, particularly in higher education and scientific research. At the same time, universities have been under growing pressure to integrate digital tools and online learning practices. These developments have created new expectations for ESP teachers, who are now required to combine language pedagogy, disciplinary awareness, and technological competence. However, many ESP teachers in Algeria have had limited access to structured professional development in online pedagogy, which has affected their ability to adapt effectively to digital teaching environments.

The present study emerged partly from the findings of the researcher's master's thesis "Integrating E-learning Teaching in ESP during the COVID-19 Pandemic": The Case of

Second-Year Management Students at The Higher School of Management, Tlemcen that was carried in (2019 - 2020). That earlier work revealed several challenges affecting the effectiveness of online ESP instruction, including insufficient professional development in online pedagogy, limited familiarity with digital teaching tools, and the absence of specialized online training programmes for ESP teachers. These issues indicated the need for a more focused investigation into how professional development could support ESP teachers in strengthening their online pedagogical competence.

The problem addressed in this thesis is therefore the limited preparedness of ESP teachers in Algerian higher education to teach effectively in online environments. While ESP teachers may be experienced in conventional classroom teaching, online pedagogy requires additional competencies related to digital tools, learner engagement, online interaction, lesson design, and content adaptation. This need is even more pressing in cases where teachers come from general English backgrounds and have not received specialized preparation in ESP pedagogy or online teaching.

Accordingly, the main aim of this study is to examine how targeted professional development can support ESP teachers in developing competencies for online pedagogy. More specifically, the study seeks to identify teachers' professional development needs, design a training intervention that responds to those needs, and evaluate the extent to which the intervention contributes to changes in teachers' online pedagogical practices.

To achieve this aim, the study addresses the following research questions:

RQ1: What specific competencies do ESP teachers need to develop to succeed in online pedagogy?

RQ2: What strategies can be used to effectively meet the professional development needs of ESP teachers in online pedagogy?

RQ3: How does specialized online training in online pedagogy influence the effectiveness of ESP teachers?

In line with these questions, the study is guided by the following hypotheses:

H1: Conducting a comprehensive needs analysis will identify the key skills and competencies ESP teachers require to succeed in online pedagogy.

H2: Designing a targeted online training course will address the sub-skills and competencies essential for ESP teachers' success in online pedagogy.

H3: Providing ESP teachers with specialized online training tailored to their skill levels will enhance their ability to perform effectively in online teaching environments.

The significance of this study lies in its contribution to the literature on ESP teacher professional development and online pedagogy in Algerian higher education. First, it addresses a relatively underexplored area by focusing on the professional development of in-service ESP teachers rather than on learners or curricula alone. Second, it examines online pedagogy as a practical and pedagogical challenge in ESP rather than as a purely technological issue. Third, it provides context-sensitive evidence from Algeria, where the expansion of English and the digital transformation of higher education make this issue particularly relevant.

Methodologically, the study adopts a participatory action research design using a mixed-methods approach. It involved eight ESP teachers from different Algerian universities and was organized in three phases: an initial needs analysis, a training phase, and a post-training evaluation phase. Four instruments were used in the study: a needs analysis questionnaire, pre-training and post-training observation grids, the online training intervention, and a post-training feedback questionnaire. Quantitative data were analyzed using descriptive statistics, while qualitative data were examined through qualitative content analysis and thematic analysis.

This thesis is divided into four chapters. Chapter One reviews the literature related to ESP, teacher professional development, and online pedagogy, while also situating the study

within the Algerian context. Chapter Two presents the research methodology, including the design, participants, instruments, and procedures used in the study. Chapter Three reports and discusses the findings of the research. Chapter Four synthesizes the main results, outlines the limitations of the study, and presents recommendations for policy, practice, and future research.

CHAPTER ONE:

LITERATURE REVIEW

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1.1. Introduction

This chapter reviews the literature relevant to the present study and establishes the conceptual foundation for examining ESP teacher professional development for online pedagogy in Algerian higher education. Rather than treating ESP, teacher development, and online pedagogy as separate domains, the chapter brings them into relation to clarify how they intersect in contemporary higher education contexts.

The chapter begins by tracing the historical development of ESP and discussing its main definitions, domains, and theoretical orientations. It then situates ESP within the Algerian linguistic and educational context by examining language policy, the position of English in higher education, and the specific challenges affecting ESP provision in Algeria. The review subsequently turns to teacher competency and professional development, with particular attention to the knowledge, skills, and support structures required for effective ESP teaching. It then examines online pedagogy, technology integration, curriculum development, and teacher assessment in digitally mediated learning environments. Finally, the chapter considers international case studies and recent developments in ESP teacher development to identify the most relevant conceptual and practical implications for the present study.

A central purpose of this review is not merely to summarize previous literature, but to identify the points of convergence, the unresolved tensions, and the empirical gaps that justify the present research. In particular, the review shows that although the literature on ESP, teacher professional development, and online teaching is well established in some contexts, less attention has been paid to the professional development of in-service ESP teachers in resource-constrained higher education settings such as Algeria, especially in relation to online pedagogy. The chapter therefore culminates in a conceptual positioning of the study and a clear articulation of the research gap it addresses.

1.2. Historical Development of ESP

The effects of the Second World War on science and technology led to an unprecedented expansion in these fields. This resulted in creating a unified world with the domination of science and commerce as two entities. For the latter to grow rapidly and meet the New World's demands, the emergence of an international medium of communication became increasingly important. Hence, the global spread of English was mainly linked to the superlative economic growth of the United States, the global free trade policy shift, and the dawn of the computer age (Johns & Dudley-Evans, 1991; Strevens, 1988). A new generation of people became drawn to learning English for clear economic, academic, and professional reasons, knowing that it was the key to the developments in the fields of commerce and technology. As English began to pave its way as an international language, a new generation of learners was created, with different interests and needs related specifically to their vocations. Those specific needs were a major factor that influenced them to learn, as they developed a purpose in the process. This development contributed to the emergence of English for Specific Purposes. (Hutchinson & Waters, 1987).

In the period between the 1960s and 1970s, ESP was born as a technical texts-analysis area and was undergoing a developmental stage that led to the evolution of many linguistic theories based on the works of Peter Strevens, Jack Ewer, and John Swales (Swales, 1990; Robinson, 1991). According to them, identifying the lexical and grammatical features of various registers was more effective when analyzing them in different areas of specialization, like Information Technology, Electrical Engineering, and Mechanical Engineering. Based on those linguistic features, teaching materials were developed for different areas of specialization. *A Course in Basic Scientific English* by Ewer and Latorre (1969) is an

illustrative example of a similar syllabus, which aimed at producing one that gave significant priority to the language forms that students would meet in their specialized study areas.

At the end of the decade, studying language use over language form strengthened, making materials development a popular trend. During the 1970s and 1980s, the movement towards prioritizing language skills gained noticeable traction, accompanied by significant research advancements (Dudley-Evans & St. John, 1998). Central concepts such as rhetorical moves, genre, and expert consultancy were introduced during this period (Swales, 1990). Over the past two decades, research in English for Specific Purposes (ESP) has flourished, particularly on an international scale, supported by the emergence of new journals and a substantial increase in paper submissions that highlighted the significant growth of ESP (Flowerdew & Peacock, 2001). Therefore, emphasizing the evolution of the understanding and definitions of the latter in parallel with its development. While some view it as an approach and others as a distinct discipline, ESP continues to adapt to learners' specific professional and vocational language needs. As Harding (2007) points out, ESP is fundamentally about "the language for getting things done" to ensure its ongoing relevance and applicability.

1.2.1. General English in Contrast to English for Specific Purposes

With the continuous growth of ESP, it was becoming even more distinct from GE. As ESP courses were designed to meet the learner's specific occupational, professional, or academic requirements, it became an essential approach used and applied in different educational and professional contexts (Dugosija, 2022). English for Specific Purposes (ESP) and General English (GE) are considered two branches of (ELT), with common effective and efficient aspects in learning as the goal. According to Hutchinson and Waters (1987), these two branches are not fundamentally different in theoretical terms, but they differ substantially in practice. While the teacher focuses on the syllabus in GE, the Learner's needs are the central

focus in ESP, meaning language nature is no longer the sole center of the teaching universe, as learning and teaching dominate the field.

From the teaching perspective, the ESP teaching approach is undoubtedly learner-centered, in which the learner's goals and needs are the top priority. Meanwhile, GE teaching emphasizes a language-centered approach, as it focuses on language skills and the English community's cultural aspect (Robinson, 1980). Hutchinson (1987) highlighted the difference between General English and ESP in terms of learner's age and their degree of awareness. ESP is mostly dedicated to adults who are aware and responsible for their language needs, while GE often targets the younger generation, like high school students whose first and main goal is to pass their examination since the General English courses are mandatory as part of their curriculum development.

The goals and approaches of General English Teaching (GELT) contrast with those of English for Specific Purpose. The former goes from a specific point to a general one, and often starts with well-defined content grammar, vocabulary, and any other content that targets the four skills of language: reading, listening, speaking, and writing. However, the final goals are more general, focusing on improving communication skills, preparing for social interaction, and achieving overall language proficiency. Due to the number of possibilities of how English will be used by the learner in the future, the outcome of GELT is somewhat less defined.

ESP, on the other hand, is more focused on its teaching goals. It targets the learners' specific needs of the English language in a particular field, like business, engineering, law...etc. ESP learning process is designed with clear objectives from the start, in order to meet required necessary skills to perform specific tasks within professional context. In this case, the process is more intentional and goal-driven than GE, with the aim of achieving those defined objectives. Basturkmen (2006) explained that "The emphasis in ESP on going from A to B in

the most time- and energy efficient manner can lead to the view that ESP is an essentially practical endeavour”, which means that this field develops its own methodology by getting different language features from various disciplines. ESP aims for the needs and aspires for an effective communication for learners in the targeted specialty (Bojovic, 2006).

1.2.2. Pivotal Studies and Theoretical Milestones in ESP

Like any other major field, English or Specific Purpose has been shaped by several research studies and theories, which tailored language teaching to the specific needs of learners in their specialized professional and academic contexts. The work of Hutchinson and Water (1987) on needs analysis provided a foundation for ESP. It advocated for a focus on identifying the language skills learners need in their respective fields. The concept of discourse communities was introduced by John Swales (1990), where he highlighted the Importance of understanding communication norms regarding specific groups, to design effective programs language. Genre analysis and task-based learning are a few of the many theoretical advancements that further expanded ESP, moving the field beyond traditional areas such as science and business to others such as law and healthcare. Due to the development of various models of needs analysis, including Dudley-Evans and St. John’s approach (1998) and Munby’s Target Situation analysis (1978), ESP curriculum design is continuously guided, ensuring its relevance to the professional goals of learners in the current globalized world.

The evolution of ESP teaching theories has served as a crucial development in language education, specifically since the 1960s. Five phases led to the emergence of theories, and they are represented in register analysis, discourse analysis, rhetorical analysis, target situation analysis, skills and strategies, and a learning-centered approach. The more specialized English was demanded, the more stages were shaped in different vocational and academic fields. Furthermore, English for Science and Technology had a crucial role in the early development

of ESP, with strong contributions from theorists like McIntosh, Halliday, and Stevens (1964) to fundamentally understand the possible uses of language in specific disciplines. As a result of this foundation, several sophisticated ESP approaches emerged, addressing learner's particular needs in technical or academic domains.

The first major theoretical approach in ESP known as Register Analysis, emerged in the mid-1960s and took the lead as the groundwork for the very first course design. The focus of this approach was the identification and analysis of the lexical and grammatical features of language within different registers of various professional specialties. Ewer and Latorre (1969) are the main scholars who pioneered the approach, by putting grammar and vocabulary teaching as the center focus in the targeted specific field, such as engineering or science. For example, their purpose in analyzing scientific texts is to isolate the most common structures and technical terms used in these contexts. However, the register analysis approach was criticized for its extensive focus on form rather than function, despite being instrumental in highlighting language specificity. Thus, more communicative approaches were developed, addressing language in use.

The theoretical approach that represented a significant shift in ESP theory in the late 1970s and early 1980s, is rhetorical and discourse analysis. The latter moved beyond sentence-level grammar and explored the functionality of texts as coherent, purpose-driven units of communication. John Swales (1981), with his work on genre analysis, represented a key figure in this movement, in which he explored the way various types of writing are structured for a particular discourse community expectation, such as research articles. Throughout this approach, the language communicative purpose was emphasized, focusing on the functional relationship between sentences and paragraphs to convey meaning. Understanding how language is used in real-world contexts has become a central part of ESP teaching. One

important step in this direction was the study of discourse patterns, which helped educators uncover how language functions in different professional settings. This kind of analysis allowed ESP practitioners to design materials that go beyond grammar or vocabulary drills—they focused instead on helping learners develop the communication skills they would actually need in their fields. By doing so, educators were able to create more practical and effective resources aimed at boosting students' ability to use English confidently and appropriately in specialized areas.

Another major turning point came in the late 1970s, when Target Situation Analysis (TSA) began to shape how ESP courses were designed. TSA was all about figuring out the kinds of communication learners would likely engage in at work or in academic environments. One key contribution was Munby's 1978 book *Communicative Syllabus Design*, which introduced a structured method for conducting needs analysis. Munby's framework helped identify the exact language skills required by professionals—such as engineers or businesspeople—to succeed in their roles. This led to the development of ESP courses that were much more tailored to real-life contexts, making the learning process more relevant and purposeful. However, while TSA brought a more targeted and functional approach to language learning, it wasn't without criticism. Some pointed out that it focused too narrowly on what language learners *needed to do*, without paying enough attention to *how* they actually acquire those skills. This limitation opened the door for later approaches that aimed to balance both the demands of real-world use and the learning process itself.

A second influential ESP theoretical background that emerged was the skills and strategies approach, which was concerned not so much with language itself as with the cognitive processes learners use to understand and produce language in particular contexts (M. J. van Naerssen 1987). Ideas from cognitive psychology and reading comprehension pieces of literature have a strong influence on this strategy. Hutchinson and Waters (1987), for example,

argued that an information process approach should be applied to students. Hence, they are better prepared to predict material or infer meaning from context when confronted with new texts. Focusing on skills such as reading for gist and scanning, or listening for specific information in work-related contexts, this approach encouraged students to be active data processors. By equipping students with these abilities, ESP classes managed to effectively prepare them for the challenges of their specific occupations or fields of study since they could apply these techniques in a variety of situations.

The learner-centered approach marked a huge theoretical turning point by extending the focus on the motivations, needs, and learning processes of the learner instead of language content. It acknowledged that the varied origins and experiences of ESP students should be the focus of their education. Thanks to this method, the Learners connection with assimilated knowledge was sincerely considered by effective ESP training, and the notion of ESP being a question of language features or specialised terminology was rejected. Since then, this method dominated the arena and became the center stage in the design of modern ESP courses, impacting both research and instructional strategies.

Taken together, these theoretical developments show that ESP has evolved from a narrow concern with linguistic forms and technical registers toward a broader understanding of language as situated, purposeful, and learner-centered. Early approaches such as register analysis helped establish the specificity of disciplinary language but were criticized for emphasizing form at the expense of communicative function. Later approaches, including discourse analysis, target situation analysis, and learner-centered models, responded to this limitation by foregrounding purpose, context, and learner needs. This progression is important for the present study because it confirms that effective ESP teaching requires more than content knowledge or vocabulary selection; it requires pedagogical decision-making grounded in learners' academic and professional realities. However, while these frameworks are well

established in ESP theory, the literature has paid comparatively less attention to how ESP teachers themselves are prepared to enact such principles in online environments. This unresolved issue is central to the current research.

1.3. ESP Definition: Scope and Domains

English for Specific Purposes (ESP) is a popular, dynamic and one of the most specialized areas within the realm of language, focused on teaching systematic and so-called targeted language use in academic or professional purposes. While general English is concerned with the growth of a wide range of language skills across various disciplines, ESP is context and discipline specific. The curriculum, teaching methodologies and objectives are specifically designed to meet the functional language needs of specific disciplines like business, medicine, law engineering & technology. Such an approach is known as ESP, and as such, it is uniquely applicable to people who need the language skills quickly for larger problems (Hutchinson & Waters, 1987).

According to Dudley and St John (1998), ESP is an approach to language learning that is based on the needs of the learner, and it recognizes the significance of context in foreign language contexts. They say that ESP is focused on the goals of learners and the language they need to use in particular contexts. The focus of ESP on the functional use of language is what makes it unlike more traditional approaches to language teaching. When comparing to general grammar, vocabulary or conversation course, ESP is designed for needs that they have with technical, zoning language and any industry discourse which would assist in thriving fields. ESP is a very broad and flexible field covering various areas such as English for Academic Purposes (EAP), English for Occupational Purposes (EOP) among many other specialized fields like English for Medical Purposes, English for Legal Purposes and English for Science and Technology. As an example, a course for people who work in health would emphasize the

vocabulary related to medicine, communicating with patients and physicians, or writing reports; an engineering course would spend time on technical specifications, project documentation, and giving presentations at conferences. In this way, ESP is always relevant to different fields of the profession and academia (Dudley-Evans & St John, 1998).

The characteristic that sets ESP apart is the direct and immediate uses of the language. Industry experts or academic professionals often develop course materials and assessments in close collaboration to ensure that the content meets real-world expectations. This makes sure that the learners are easily able to transition from classroom learning and acquire the skills needed in the workplace. In a business setting, for instance, ESP learners could practice role-plays of negotiations, write business emails, or discuss case studies specific to their fields. Such activities allow for the development of not only linguistic skills, but also critical thinking, problem-solving and interpersonal skills necessary in a professional setting. Moreover, ESP instills communicative competence through exposure to real-life language situations. It focuses on how language works in specialized domains, enabling users to navigate the complexities of field-specific discourse--whether professional or academic. This approach helps learners to engage with their colleagues, clients or stakeholders in a more effective manner by understanding the linguistic and cultural conventions in those domains (Hutchinson & Waters, 1987; Dudley-Evans & St John, 1998).

Teaching English for Specific Purposes is one of the significant parts of today's language teaching system, providing a highly contextualized and practical approach to language learning. It provides language and communication strategies for professional success by targeting the specific needs of particular fields of its versatility to address the real world, ESP is an indispensable part of language teaching in the contemporary globalized and specialized setting.

1.3.1. Various Interpretations of ESP

English for Specific Purposes (ESP) lends itself to various interpretations, which is typical of the dynamic and flexible nature of ESP. According to Hutchinson and Waters (1987), ESP is an approach wherein all decisions pertaining to content and method are based on the learner's reason for learning. This definition emphasizes one of the main characteristics of ESP, which is goal oriented. ESP operates differently from General English in its orientation and objectives, and it prioritizes communication needs in the specific field, whether it's writing technical reports or academic papers; as well interacting with clientele.

One way of looking at ESP stresses its functional nature. According to this perspective, ESP is solely concerned with language preparation for real-life purposes. An ESP course for healthcare professionals, for instance, might include aspects of communicating with patients, medical English, and writing case notes (Dudley-Evans & St. John, 1998). A course on legal practice, for example, might cover topics such as contract drafting and courtroom advocacy skills (Hutchinson & Waters, 1987). Proponents of this view suggest that ESP should always be closely related to the students' specific situation, to maintain relevance (Anthony, 2018). This purpose-driven approach prioritizes learners' immediate professional or academic goals, ensuring that language instruction aligns directly with their real-world needs.

Educators and scholars might have a broader perception of ESP as an open-ended framework not limited to students' immediate learning needs. Although still focused on particular contexts, this understanding includes transferable skills like critical thinking, collaboration, and adaptability (Hyland, 2006; Belcher, 2009). This focus, in turn, fosters the development of broader competencies among learners to succeed beyond school by using their language-based skills wherever and whenever they might need them later in professional or academic contexts (Douglas, 2000). For example, an ESP course developed for engineering

students may not only address technical vocabulary but also emphasize effective communication in multinational teams working collaboratively to solve project-related problems (Morrison, 2020). Such an approach reflects the belief that ESP should equip learners with both discipline-specific language and transferable soft skills to navigate dynamic, real-world challenges.

The differences in these interpretations have practical ramifications for the design, delivery and assessment of ESP courses. A purely functional approach may focus heavily on task-based learning, with activities closely reflecting real-life tasks such as giving presentations or writing emails. A wider approach may combine the communicative and also intercultural abilities that help learners to fit into various workplaces or academic settings. The narrow-angled vs wide-angled ESP distinction further complicates this. Narrow-angled ESP is confined to related professions or tasks (such as English for pilots, academic publishing, etc.). In contrast, wide-angled ESP addresses fewer specific requirements in a certain area (e. g., English for businesspeople). While narrow-angled ESP ensures relevance and precision, wide-angled ESP provides a sense of versatility or transferability; both options have their benefits.

This was informed by the teaching methodology behind ESP. Task-based learning, content-based instruction and project-oriented learning are often used to connect the language taught in class to real life use. These utilize real-world tasks that emulate learners' target-contexts and are effective for both linguistic and communicative competence. The different views on ESP are a manifestation of its flexibility and sensitivity towards learners. Whether narrowly functional, looking only at near-term utility or broader in its emphasis on transferable skills, ESP is no longer an optional but rather an indispensable feature in contemporary language education. These perspectives enable educators to tailor their courses accordingly and fulfill the various aims of their learners.

1.3.2. Academic and Occupational Purposes Distinctions

ESP performs different roles within its two main strands: namely, English for Academic Purposes (EAP) and English for Occupational Purposes (EOP). These subdivisions cater to specific needs of learners studying English in academic and professional contexts, which also influence the selection of content, methods and outcomes of ESP programmes.

EAP is primarily concerned with equipping students with language and communication skills needed for academic success. According to Flowerdew and Peacock (2001), EAP includes skills for reading and criticizing academic papers, writing research reports, and giving presentations as part of researchers' training. For students who are entering higher education, especially in subject areas where English is the medium, these competencies are critical. As an example, international students in English-speaking universities generally need to be supported in mastering academic conventions, covering everything from how to cite works properly to how to make arguments in essays.

A central component of EAP is critical thinking and engaging with academic content. In addition to language skills, Learners are expected to synthesize information from multiple academic sources, build a cohesive argument supported with research evidence and engage in scholarly debates. Many EAP programs utilize authentic materials, such as journal articles, lecture recordings and case studies to expose learners to the academic genres they are going to need (Oxford, Lee, Snow & Scarcella, 1994)

Meanwhile EOP is primarily for those entering or currently in a professional context. EOP courses are designed to give students specific practice in the language and communication needs of certain workplace contexts — for example, writing business emails, negotiating contracts or giving technical presentations. EOP courses are highly context-based, relevant to the learner's company or field of work. EOP classes for engineers may include topics such as

technical writing, safety communication, and communicating with project management. Likewise, a class for health care practitioners might feature consultations, charting and ethics.

An important difference between EAP and EOP is their timeframes and goals. EAP commonly prepares learners for longer-term study success, building their foundational skill set that can be transferred to a variety of disciplines. On the other hand, EOP is usually based on workplace immediacy—equipping learners with the communicative practices required they need to perform in specific roles/ tasks. While different EAP and EOP both are purpose-oriented language teaching.

A further point is the overlap between EAP and EOP. A medical student may need EAP to complete their academic courses and EOP to communicate in patient encounters during clinical rotations. Such changing goals of learners necessitate ESP programs to meet their needs and their dynamically shifting directions; hence moving policy makers towards this intersection point. Therefore, distinguishing the differences and relations of EAP to EOP can help educators create specific ESP programs appropriate for individual learners. ESP plays a critical role, helping students develop the language skills they require to achieve either academic success or business advancement (Dudley-Evans & St John, 1998).

The distinction between EAP and EOP confirms that ESP is not a single uniform practice, but approaches shaped by academic, occupational, and institutional demands. What unites these strands is the principle that language teaching must respond to context-specific communicative purposes. At the same time, the literature also shows that ESP cannot be reduced to technical vocabulary or narrowly defined occupational tasks; effective ESP instruction also requires transferable skills, discourse awareness, and adaptability across contexts. This has direct implications for teacher development. If ESP is both specialized and flexible, then ESP teachers must be prepared not only to respond to disciplinary content but

also to design instruction that integrates language, pedagogy, and context. The challenge becomes even greater in online settings, where disciplinary specificity must be combined with digital pedagogy and interactional design. The literature therefore suggests a need for professional development models that are both ESP-specific and technologically informed.

While the previous sections clarified the conceptual scope and domains of ESP, the field cannot be fully understood without reference to the context in which it develops. In Algeria, ESP is shaped not only by pedagogical concerns, but also by broader linguistic, historical, and educational factors. Consideration of language policy is therefore necessary in order to situate ESP within the national context of this study.

1.4. Language Policy in Algeria

Algeria's language policy reflects the complexity of its historical and sociocultural background, creating a coexistence between four languages: Arabic, French, Berber, and, to some extent, English. This interplay between languages, particularly the role of English as a foreign language (EFL) and English as a second language (ESL), has a profound impact on educational practices, including the emergence of English for Specific Purposes (ESP). Understanding Algeria's language policy is crucial for examining how linguistic priorities shape ESP curriculum development and practice. Historically, the French language has had a significant influence in Algeria, remaining dominant in administration, education, and public discourse since the colonial period (Grandguillaume, 2004).

Following independence in 1962, the Arabization policy was implemented to revive the status of Arabic. This policy aimed to reaffirm a national identity by integrating Arabic into education, governance, and cultural expression (Benrabah, 2013). However, French continues to be the primary language for technical and scientific education due to its historical legacy (Chaker, 2004). The recognition of Berber as a national language in 2002 added another

dimension to Algeria's linguistic landscape. More recently, there has been an increasing focus on English due to its status as a global lingua franca.

The rise of English is linked to globalization, as many companies and institutions prioritize English for international communication, scientific research, and economic competitiveness (Crystal, 2003). This linguistic diversity presents both challenges and opportunities for ESP in Algeria. The dominance of French in specialized fields such as engineering, medicine, and business necessitates transitional ESP programs that facilitate the shift from French to English (Belmihoub, 2018). Additionally, the multilingual context means that ESP does not operate in isolation from Arabic and Berber, both of which serve as linguistic substrates upon which English proficiency is developed (Benmoussat, 2022).

The influence of language policy on ESP objectives is evident in government initiatives that encourage English as a medium of instruction in higher education, particularly in STEM disciplines (Ministry of Higher Education, 2020). These policies aim to align Algeria's education system with global standards and foster international cooperation and competition (Benrabah, 2017). Despite these advancements, several challenges hinder the full implementation of ESP in Algeria. Limited resources for English instruction, a shortage of trained ESP teachers, and resistance to English due to the entrenched status of French and Arabic remain key obstacles (Rouabah, 2022). Policymakers must invest in teacher training, curriculum development, and multilingual resource-building to address these issues effectively. Algeria's language policy significantly influences the evolution of ESP, shaping its focus, approaches, and outcomes. The growing emphasis on English highlights Algeria's aspiration to produce graduates who can engage in global communication and succeed in their professional fields. However, achieving these objectives requires a balanced approach that respects Algeria's linguistic heritage while leveraging the opportunities that English presents in the contemporary world (Benrabah, 2017).

1.4.1. Historical Overview of Language Policy

The language policy in Algeria has evolved immensely under the shadow of colonialism and attempts at post-independence identity building. English for Specific Purposes (ESP) developed in the wake of this history and has had a profound effect on classroom practice, or at least seeks to have. French became the official language during French colonialism (1830–1962) when it was used for administration, education, and public life (Salhi, 2000). Arabic and Berber, although officially recognized in the early 2000s, were given a secondary role as symbols of resistance rather than practical languages of governance and education (Belmihoub, 2018). This period entrenched French in a technical-scientific register and established the foundations for its post-independence permanence.

Shortly after Algeria became independent from France in 1962, the government initiated an Arabization policy to reassert Arabic as the top language of national identity and instruction. Hamdan and Kessar (2023) explain that this policy aimed to unify the country linguistically and culturally, within the broader context of decolonization movements across North Africa. The Arabization policy encountered challenges, particularly in graduate studies and technical fields dominated by French due to its strong historical presence in these domains (Mouili, 2024). The reliance on French in these areas created obstacles to the full implementation of Arabization, as there were limited academic resources available in Arabic for specialized fields.

Algeria embraced Berber as an integral aspect of its linguistic heritage in the 1990s. The recognition of Berber as a national language in 2002 and its elevation to an official language in 2016 reflect a more pluralistic approach to Algeria's linguistic identity (Rouabah, 2022). This development represents an attempt to balance national unity with cultural pluralism. More recently, English has gained attention in Algeria due to globalization and the

country's increasing integration into the international market and scientific community (Senouci & Mama, 2024). English is now viewed as a tool for international cooperation, scientific research, and investment. In higher education, efforts to provide English-medium instruction in fields such as engineering, business, and medicine are gradually emerging (Jacob, 2019).

These developments encapsulate the tensions and synergies between Algeria's linguistic heritage and its aspirations for global engagement. The multilingual setting of Algeria necessitates a nuanced approach to ESP that considers the roles of Arabic, French, and Berber in shaping learners' experiences with English. The dominance of French in technical education poses a challenge for transitioning from French to English in specialized domains (Boudersa, 2018). Conversely, the Arabization and standardization of Berber create a distinctive linguistic environment that influences English language learning (Othmane & Bouyakoub, 2020).

Algeria's historical language policies have created a complex multilingual environment that significantly influences ESP programs. Developing effective ESP courses requires an understanding of this historical background to ensure alignment with national identity while also addressing global educational and professional demands. Future efforts should focus on bridging linguistic gaps, particularly between French and English, and fostering multilingual competence to better equip learners for the evolving global landscape.

1.4.2. Impact on ESP Development in Algeria

Language policy in Algeria has played a substantial role in shaping English for Specific Purposes (ESP) programs, influencing their design, implementation, and outcomes (Hamdan & Kessar, 2023). The development of ESP is deeply connected to applied linguistics and language policies, which must address the linguistic diversity of the country, encompassing

Arabic, French, Berber, and English (Rouabah, 2022). Algeria presents itself as a unique context for ESP, where historical, cultural, and global considerations play a significant role.

Historically, French was the primary language of technical and scientific education, shaping the early stages of ESP. Initially, French for Specific Purposes (FSP) dominated fields such as engineering, medicine, and business due to the substantial integration of French vocabulary and discourse practices (Salhi, 2000). However, with globalization and the emergence of English as the new lingua franca in international business, science, and technology, ESP programs have increasingly shifted towards English (Jacob, 2019).

This transition has not been without challenges. One major obstacle is the lack of resources, including updated textbooks, multimedia tools, and online materials tailored to the Algerian context (Othmane & Bouyakoub, 2020). Most available ESP materials are designed for ESL learners in native English-speaking contexts, necessitating significant adaptation for Algerian students (Boudersa, 2018). Additionally, there is a shortage of trained ESP instructors, and many teachers lack specialized training to develop and deliver ESP courses that align with professional and disciplinary needs (Senouci & Mama, 2024).

Another significant challenge arises from the entrenched linguistic hierarchy in Algeria. Arabic remains strongly associated with national identity, while French continues to be the dominant language of technical and professional fields. This dynamic often places English in a precarious position, with some perceiving it as a competing force rather than an asset. Policymakers and educators must work to shift this perception, emphasizing the practical benefits of English for global engagement and career opportunities while respecting the multilingual reality of Algeria (Belmihoub, 2018).

Despite these challenges, the demand for English in ESP is gaining momentum. Many universities and vocational training centers in Algeria are developing ESP programs aligned

with international standards (Hamdan & Kessar, 2023). For instance, medical schools are incorporating English into scientific language courses to facilitate universal communication, while engineering programs emphasize English for technical writing and presentations to prepare students for global markets (Jacob, 2019). The implications of language policy for ESP extend beyond curriculum design to assessment and certification. To ensure that students' language proficiency meets international standards, many Algerian institutions are aligning their ESP programs with the Common European Framework of Reference for Languages (CEFR) (Senouci & Mama, 2024). This alignment not only enhances the credibility of ESP programs but also promotes student mobility and employability in international contexts.

Furthermore, language policy has had both limiting and enabling effects on the development of ESP curricula. While the historical reliance on French initially created barriers, the increasing need for English as a global language has driven significant progress in ESP education. Overcoming resource constraints, investing in teacher training, and addressing cultural resistance will be crucial for further developing ESP in Algeria. By adopting a balanced and strategic approach, policymakers and educators can foster a multilingual environment where ESP thrives, ultimately equipping Algerian students with the linguistic tools necessary for academic and professional success.

1.4.3. ESP Teachers and Professional Development in Algeria

In Algeria, it is common for general English teachers to be appointed as ESP teachers, often without specialized training in the specific needs of the fields they are assigned to teach. While these educators may have strong backgrounds in general English, they are frequently asked to teach ESP courses without the necessary preparation to address the unique demands of technical or industry-specific language instruction. This can lead to significant gaps in the

quality of ESP education, as these teachers may lack the expertise required to deliver content that aligns with the specialized needs of students in areas like science, business, or technology.

Moreover, even when there are teachers specifically assigned to ESP roles, they often do not receive any professional training that keeps them updated with 21st-century skills and evolving teaching methodologies. This issue became particularly evident when the COVID-19 pandemic hit, forcing a sudden shift to online learning environments. Many ESP teachers, both general English educators reassigned to ESP and those already in ESP roles found themselves unprepared to adapt to the new digital teaching context. Without prior exposure to online pedagogy or sufficient professional development, they lacked the knowledge to effectively engage students in the virtual classroom, highlighting the urgent need for continuous professional training that equips ESP teachers with the tools to navigate diverse teaching environments.

1.4.3.1. Current ESP Teaching Situation in Algeria

The need for English for Specific Purposes (ESP) continues to grow, particularly in higher education institutions and in key industries such as oil, gas, and telecommunications. At universities, English is either integrated as a core module in specialized departments or offered as a compulsory course in non-linguistic fields. The push for ESP instruction reflects the broader national effort to enhance communication skills and facilitate access to technical knowledge in sectors critical to the economy. Companies like Sonatrach, the national oil company, and Mobilis, a major telecommunications provider, increasingly rely on English for internal and external communication, making ESP essential for workforce readiness.

Despite this growing demand, the current ESP teaching situation faces several challenges. Most ESP instructors are general English teachers who have been appointed to

teach ESP without specialized training. This lack of focused preparation affects the quality of instruction, as many educators are unfamiliar with the specific terminology and communication styles required in technical or professional fields. Moreover, the time allocated for ESP instruction is limited, often amounting to only a few hours per week, and the courses are frequently scheduled at inconvenient times. These constraints make it difficult for students to gain adequate exposure to the language in the context of their fields of study or work.

1.4.3.2. Professional Development Needs for ESP Teachers

A critical issue in Algeria's ESP teaching landscape is the lack of professional development opportunities tailored to the needs of ESP educators. General English teachers are commonly assigned to teach ESP courses without receiving formal training in specialized pedagogy. This gap in training leaves many instructors ill-equipped to meet the specific needs of students in fields like engineering, business, telecommunications, and oil and gas, where technical English proficiency is vital for both academic success and professional advancement.

The need for professional development is particularly acute in industries such as Sonatrach and Mobilis, where employees must navigate complex technical documentation and communication in English. ESP teachers need to be trained in industry-specific language and communication skills to adequately prepare students for these professional environments. Additionally, there is a pressing need for programs that focus on modern teaching methodologies, assessment strategies, and subject-specific content integration. The COVID-19 pandemic further underscored the importance of these training needs, as many teachers were unprepared for the rapid shift to online learning and lacked the necessary skills to deliver effective ESP instruction in a digital format.

1.4.3.3. Incorporating Online Pedagogy in ESP

In the post-COVID-19 era, a series of resolutions have been introduced to adapt to the changing demands of higher education in Algeria, particularly in the realm of online pedagogy. One of the key initiatives is Resolution No. 1242, issued on September 22, 2022 (see Appendix 01), which established the Sectoral Committee for Monitoring and Implementing E-learning in Higher Education Institutions (HEIs). This was spearheaded by the Minister of Higher Education and Research, Kamel Badri, to promote the integration of digital learning. Soon after, on September 25, 2022, Resolution No. 1243 (see Appendix 02) followed, creating a national committee tasked with evaluating and improving internet services essential for supporting online education. Furthermore, Resolution No. 1406, enacted on November 17, 2022 (see Appendix 03), established the National Committee for Digitization, clarifying its responsibilities and guiding the digital transformation in higher education. Together, these measures have significantly influenced the adoption of online pedagogy in Algerian universities.

Complementing these initiatives are two other important resolutions aimed at enhancing English language instruction and its digital integration. Resolution No. 1998, dated December 22, 2022 (see Appendix 04), launched a dedicated digital platform for the remote teaching of English, specifically designed to support higher education professors. This initiative underscores the growing emphasis on English language proficiency among university faculty members. Additionally, Resolution No. 1433, issued on December 28, 2022 (see Appendix 05), further promoted the use of English in higher education, with a focus on increasing the international visibility of scientific research conducted in Algeria and encouraging the global engagement of Algerian universities.

These resolutions have directly impacted the field of English for Specific Purposes (ESP), which has become increasingly prioritized by both researchers and educators. The growing demand for ESP courses and professional development, particularly in online formats, reflects the heightened need to integrate online pedagogy into ESP teaching. Many educators are still adapting to the use of digital platforms, and the inclusion of online pedagogy is essential for ensuring the effectiveness of ESP instruction. By addressing these challenges, these reforms aim to improve the quality of both teaching and learning in ESP, making higher education in Algeria more responsive to global academic and professional demands.

1.4.4. Current Trends and Future Directions

Algeria has embarked on significant higher education reforms aimed at improving the quality and accessibility of education. One of the most notable reforms has been the introduction of English as the primary language of higher education and scientific research. This shift was initiated in 2019 by former Minister of Higher Education Tayeb Bouzid, who launched a national survey for students, teachers, and administrators and established a committee of 30 experts from Algerian universities to work on recommendations for promoting English in higher education (Menaceur, 2024). By 2023, under the leadership of President Abdelmadjid Tebboune, this policy marked a departure from the long-standing dominance of French. The introduction of English in primary schools and universities across all scientific streams in 2023/2024 reflects a broader strategy to integrate Algeria into the global academic and scientific community.

The motivation behind this linguistic shift includes enhancing global competitiveness and addressing historical and political complexities associated with French (Ouarni, 2023). French, a colonial legacy, has maintained a strong presence in Algerian academia and governance. The prioritization of English is part of an effort to modernize the education system,

reduce reliance on French, and align more closely with international standards (Belmihoub, 2018). This reform also aims to develop multilingual competencies among students, preparing them for a diverse and interconnected world (Rouabah, 2022).

Despite its benefits, the implementation of these reforms has encountered significant challenges. Key issues include the need for adequate teacher training, resource allocation, and the development of curricula that support the new language policy. Educational institutions must adapt to these changes while maintaining quality standards. Additionally, societal attitudes towards different languages, especially the perception of English versus French, influence the success of these reforms. Overcoming these challenges requires coordinated efforts from policymakers, educators, and communities to ensure an effective transition (Jacob, 2019).

The shift towards English has also impacted the development of English for Specific Purposes (ESP) in Algeria. As Algeria adapts ESP into its educational system, one major step has been introducing English at the early stages of education. Policymakers now call for the implementation of English instruction at primary and secondary levels to prepare students for ESP syllabi at the tertiary level. The expansion of ESP programs reflects increasing efforts to equip students for global challenges. ESP courses are now being developed for specific subject areas, such as engineering, medicine, business, and tourism, ensuring that graduates are prepared to compete in international markets (Senouci & Mama, 2024).

ESP programs are aligning with global standards to provide students with the technical and linguistic skills required for their professions. Engineering students, for example, focus on technical writing and project documentation, while medical students emphasize patient interaction and medical research terminology (Boudersa, 2018). Technology is also playing a pivotal role in ESP education. Online platforms, multimedia resources, and virtual classrooms

offer flexible and interactive learning experiences. Specialized applications allow students to engage with industry-specific terminology and simulated professional scenarios, which enhance engagement and self-paced learning, particularly in settings with limited resources (Hamdan & Kessar, 2023).

One of the main challenges facing ESP programs is the shortage of qualified instructors. Algerian institutions have introduced training courses to prepare teachers for ESP instruction. These training programs focus on needs analysis, materials design, and assessment techniques tailored to ESP. Collaboration with overseas institutions and partnerships with English-speaking countries provide valuable teaching resources and best practices to support this initiative (Othmane & Bouyakoub, 2020).

Looking ahead, the role of ESP in Algeria is expected to expand in multiple dimensions. Greater collaboration between educational institutions and industries is crucial to ensure that ESP programs meet the practical needs of the workforce. Partnerships can shape curricula and offer students hands-on learning experiences, such as internships and case studies. Moreover, multilingual education remains a balancing act. While English is gaining prominence, Arabic and Berber continue to serve as cultural identifiers and communication tools. Ensuring linguistic inclusivity can foster national unity while capitalizing on the advantages of English for global engagement (Mouili, 2024).

The ongoing development of ESP in Algeria reflects a dynamic adaptation to both global demands and local realities. Through technological integration, continual teacher training, and collaboration with industries, Algeria is building a sustainable ESP model that prepares its workforce for the challenges of globalization. By investing in ESP education, the country is positioning itself as a competitive player in the global economy and fostering an inclusive educational system that meets international standards (Salhi, 2000). While the

historical reliance on French posed initial challenges, the increasing demand for English as a global communication tool has driven major reforms. Addressing resource constraints, enhancing teacher training, and fostering collaboration between academia and industry will be essential to the continued success of ESP in Algeria. A strategic and balanced approach to multilingual education will enable Algeria to cultivate a highly skilled, globally competitive workforce.

The literature on language policy and higher education in Algeria indicates that ESP development is shaped by a complex interaction between historical legacies, multilingual realities, and contemporary policy reforms. The increasing emphasis on English in higher education creates new opportunities for ESP expansion, but it also intensifies demands on teachers who may not have received specialized preparation for either ESP or online pedagogy. In this respect, the Algerian context is not merely a background variable; it is a constitutive dimension of the problem under investigation. The literature suggests that any model of ESP teacher development in Algeria must be sensitive to linguistic transition, institutional diversity, uneven infrastructure, and the practical conditions of university teaching. This reinforces the need for a context-responsive rather than imported or generic professional development framework.

The discussion of language policy in Algeria highlights the contextual conditions under which ESP has evolved and continues to expand. However, contextual analysis alone is not sufficient to explain the pedagogical and conceptual basis of ESP as a field. For this reason, attention must now shift to the theoretical foundations that inform ESP teaching, course design, and learner support.

1.5. Theoretical Foundations of ESP

The theory underlying ESP is based on a combination of principles of language learning, course design and needs analysis. These underpinnings serve to shape curricula that address language and communication needs of specific professions or academic domains. ESP differs from general English language teaching, which prepares students to learn the way they can excel in their specific situations or contexts whether it be business, medicine, engineering or law. ESP is built on theories that still promote learner-centeredness but also highlight the importance of learners as users of English in particular contexts (Strevens, 1988).

Language learning theories are the backbone of ESP. They offer insights into the ways people learn a second language and how those processes can be maximized for different ends (Richards & Rodgers, 2014). Approaches are cognitive and sociocultural, in particular. Cognitive theories emphasize the importance of mental processes in language acquisition, involving aspects such as constituting schemata and memory that are particularly important for grasping specific vocabulary (Anderson, 1983; Sweller, 1988). In contrast, sociocultural approaches emphasize the role of interaction, and that language takes place within a social context, which means that ESP becomes synonymous with authentic tasks and collaboration (Vygotsky, 1978; Lantolf & Thorne, 2006).

Another cornerstone of ESP is needs analysis, which provides information on the linguistic requirements in a given domain related to work or study (Dudley-Evans & St John, 1998). It usually entails using procedures like Target Situation Analysis (TSA), which determines the specific tasks and communication needs to which learners will be exposed, and Present Situation Analysis (PSA), assessing their current linguistic performances as well as shortcomings (Hutchinson & Waters, 1987). Course design theories supplement the needs analysis to design ESP programs that are both relevant and practical (Graves, 2000).

By combining these theoretical views, ESP practitioners can create courses designed to provide students from differing settings with the appropriate language skills required in each context. Further, these foundations provide a basis for the continuous evolution of ESP so that it remains relevant in an ever-changing world (Hyland, 2006).

1.5.1. Needs Analysis and Course Design Theories

In fact, theories related to needs analysis and course design are an inseparable part of ESP itself by virtue of its tendency to strongly link language teaching with the special needs together with skills that are required from the learner. Needs analysis is a systematic approach to identifying the gap between existing and required language competencies. So, the steps follow in this foundation will make ESP practical course design and delivery by determining the specific goals.

There are various theoretical frameworks for needs analysis: Target Situation Analysis (TSA) and Present Situation Analysis (PSA) are highlighted by Hutchinson and Waters (1987). TSA not only emphasizes the skills that learners will need in their future profession and/or discipline (i.e. knowing technical terms or presenting concepts) but also requires explanation of how they can best demonstrate their learnings. PSA, on the other hand, assesses where learners stand and what polishing needs. Integrating TSA and PSA offers a more holistic view of learner needs; the distance separating what they can do from their sharper targets.

Theories of course design add a structural element to needs analysis by providing different frameworks, both implicit and explicit, to guide the creation of a syllabus. According to Hutchinson and Waters, a learning-centered approach focuses on adapting the content to the needs, interests and learning styles of learners. Which ensures that the learning materials are not just engaging but also practical. In addition, task-based approaches to course design, which

are entrenched in cognitive and constructivist theories of language learning, center around authentic tasks similar to professional undertakings. An ESP course for engineers, for example, might focus on tasks such as reading technical drawings, writing specifications or working in design teams.

It is an ongoing process of needs analysis and course design (Basturkmen, 2010) They also make their courses more purposeful through a constant process of checking, adapting, and modification based on feedback or new development in the profession. That is why many subjects such as medicine or IT require frequent updating of course content to incorporate cutting-edge tools and terminology.

Need analysis include learner related aspects such as motivation, cultural background, learning preferences etc. These insights empower educators to develop courses that connect with students, leading to greater engagement and retention. A blending of solid needs analysis and course design theory with grounded ESP practice, results in the development of viable programs that satisfy not just linguistic but also workplace-based needs for information skills or human capabilities on the professional learning pathway.

1.5.2. Language Acquisition Theories Relevant to ESP

Linguistic acquisition theories are foundational to understanding English for Specific Purposes (ESP) pedagogy by providing in-vivo analysis of how language learners will gain specific skills for professional settings. ESP depends on knowledge of how learners process and utilize language in specific, purpose-driven contexts. ESP instructional design is rooted in second language acquisition (SLA) theories, particularly cognitive and sociocultural perspectives.

Cognitive focuses on the internal mental processes used in learning a language (noticing, memory and output). For example, the Output Hypothesis by Merrill Swain emphasizes that language production contributes to the development of linguistic competence (Swain, 1985; Swain, 2005). This can be in terms of activities such as role-plays of work situations or writing assignments similar to those you will be doing in your field, especially in ESP contexts. Cognitive theories emphasize learning as an active process which demands that learners engage with materials and tasks that require the use of the language in progressively more complex ways (Lightbown & Spada, 2013).

Sociocultural theory (as outlined by Vygotsky, and elaborated on by Swain and Deters, 2007) considers the interactional context where language learning occurs, what happens to that learning when out of context, and how collaborative peer interaction can lead to growth (Vygotsky, 1978; Swain & Deters, 2007). These theories suggest that language acquisition occurs best when learning is taking place through purposeful speaking and listening in social situations. In this case, ESP is collaboratively worked projects where learners could work in teams to solve specific industry challenges, thus practicing a spoken or written one as part of their professional tasks. Task-Based Language Teaching (TBLT) is, therefore, not too far from this perspective because it focuses on performing objectives rather than practicing form as in grammar-based instruction (Ellis, 2003; Long, 2015).

Informed by theoretical perspectives on Second Language Acquisition (SLA), ESP pedagogy rests on these cognitive and sociocultural understandings of how individuals learn best, seeking to ensure that the learner is at the center of their own language learning experience. So, an ESP course for medical professionals, for example, could include role-plays of patient consultations, analysis of case studies and practice composition of discharge

summaries. They directly enhance each learner's professional needs and reflect the real use of language within their field.

In addition, needs analysis is at the heart of ESP and has a close relation with SLA theories. When the specific linguistic and professional needs of learners are identified, appropriate materials and activities can be viewed to help to meet these goals. This guarantees that the linguistic input is comprehensible and interesting, which SLA theories consider principal factors for an effective learning process (Krashen, 1982). When learners can see the interest of learning a language for their work, they are more motivated and then the chance of retention increases manifold (Dörnyei, 2001).

The appropriation of SLA theories by Swain and Deters (2007), which advocates extension has also opened the door for consideration of affective factors such as motivation and anxiety in ESP contexts. Learning English for work brings high stakes therefore maintaining a supportive and confidence-building environment is key. When we create assignments that taper upward in complexity and give opportunities for peer collaboration it minimizes the anxiety over performance and supports confidence. Language acquisition theories play a key role in ESP that fortifies preparation of practically sound and pedagogically principled course design. Based on cognitive processes, sociocultural interactions and appropriate needs analysis, ESP teachers can build a well-informed process of educating students to be able to use English in their particular environment with confidence.

The theoretical foundations discussed above provide an essential framework for understanding how ESP is conceptualized and implemented. Yet the practical realization of these principles depends largely on the teacher. This makes it necessary to move from theory to the question of teacher competency and professional development, which lies at the center of effective ESP practice.

1.6. Teacher Competency and Professional Development in ESP

ESP teacher competence refers to both knowledge regarding 'the content specific' and 'knowledge from pedagogy oriented towards the special learner. The focus of teaching ESP differs from general English where ESP instructors help connect the two: students' linguistic competence versus their professional and academic needs, so that they acquire relevant languages skills necessary for workplace communication. The ESP competency encompasses not only knowledge of special jargon, discourse practices peculiar to the industry but also a conduct of needs analysis (Dudley-Evans & St. John, 1998; Basturkmen, 2012). These competencies prepare teachers to create curriculum and materials that connect to the goals of learners making them more relevant and effective.

However, professional development is essential in order for ESP teachers to satisfy such demands. As the industry changes its needs, teachers have to keep learning new skills to solve new challenges and to implement new methodologies. According to Richards and Farrell (2005), the most effective professional development entails both theory and practice. However, this way allows teachers to get the basic concepts of ESP and also implement it in different classroom/studying environments.

Materials development is one of the main components of teacher competence. ESP instructors frequently create specialized materials that mirror the professional settings of their students. It calls for a knowledge of real-world context, workplace documents, technical manuals or academic texts. And they need to make plans for embedding language in professional scenarios as much as they can (Graves, 2000; Tomlinson, 2012). For instance, English for nursing might include role-plays of consultations with patients, whereas English for business is likely to focus on writing emails and negotiating.

Intercultural awareness is another vital component of ESP teacher competency. Educators have the responsibility to help students deal with cultural differences in an increasingly globalized work environment. This includes guiding students in reading between the lines, adjusting their methods of communication, and professional behavior around diversity (Hyland, 2009; Holliday, 2013).

In response to these demands, ESP teacher professional development programmes stress continuous learning by means of workshops, in-service training and reflective practices. As Richards and Farrell (2005) illustrate, such programs should be practicum-based: involving the analysis of authentic case studies; peer-interaction to share and work through ideas; and testing new ideas about teaching. The mentoring programs are also very useful because they will give opportunities for novice teachers to discover more about the profession of an experienced teacher regarding ESP teaching.

Another vital section of both teacher competency and professional development is technology. Along with supporting the integration of technology into language teaching more generally, ESP teachers need to acquire digital literacies that enable the integration of online platforms, virtual simulations and interactive tools (Hampel & Stickler, 2005; Comas-Quinn, 2011). Teachers can then use online resources in their lessons so that the lessons are more engaging, flexible and learner-centered by catering to individual needs.

Technology has become another essential aspect of teacher competence. As digitally mediated teaching becomes more common, ESP teachers need the knowledge and confidence to integrate online platforms, collaborative tools, multimedia resources, and virtual learning environments into their teaching. However, digital competence should be understood as pedagogical rather than merely technical. Teachers need to know not only how to use tools, but

also how to employ them meaningfully in support of interaction, authenticity, flexibility, and learner engagement.

The literature suggests that ESP teacher competence is multi-dimensional and cannot be reduced to linguistic expertise alone. It includes needs analysis, materials design, pedagogical adaptation, disciplinary sensitivity, intercultural awareness, and increasingly, digital pedagogy. This complexity helps explain why generic professional development is often insufficient for ESP teachers. It also supports the rationale of the present study: if ESP teachers in Algerian higher education are expected to teach effectively online, then professional development must be specifically designed to address the combined pedagogical, technological, and context-sensitive dimensions of their work.

1.6.1. Core Competencies for ESP Educators

English for Specific Purposes (ESP) teaching is built on core competences if there aims to be any success in this field of language instruction. Teachers of these topics need to have a thorough understanding of the subject material that their students will be using in the workplace or classroom, which makes sure that it's not just linguistically accurate instruction but contextualized. According to Basturkmen (2012), ESP teachers are not just language teachers who support students in their L2 writing; they also guide students' movement toward effective communication within specialized discourse communities.

One of the competencies is to create needs analyses. Needs analysis is a method which investigates students' field specific linguistic and communicative needs so that teaching can be designed to meet those requirements. For example, the requirements of medical students specializing in English will be very different from those of engineers or businessmen.

The careful changing of curriculum is yet another important skill set. ESP programs demand a rather fluid approach to lesson planning as your materials must connect with what both the students and the teacher need for their professional lives, an aspect that is quite different in common English. While intercultural awareness is important for all educators, it takes on particular significance when working with students who wish to work in international environments. Cultural awareness aids in the teaching of contextual and pragmatic language aspects, which are often critical in many communication contexts (e.g., professional).

Moreover, ESP teachers are not the ones who does not believe in learning new skills. That means knowing what is happening in their students' lines of work and integrating that knowledge into their lessons. Such linguistic and field-specific proficiency provides students with the functional tools to navigate and flourish in their fields of expertise.

1.6.2. Models of Professional Development

Models of professional development for ESP teachers are important, providing both ways to effectively prepare teachers to meet the challenges embedded in specialized in instruction and best practices that may be employed within this field (Hale, 1985; Shortall, 2012). These models span from standard workshops to more immersive ones like mentoring and reflective practice formulated through mentorship. Richards and Farrell (2005) underscore the need to reconcile theoretical grounding in professional development with practice.

Some of the more common models include workshops and in-service training programs. This gives the educators formal access to experimenting with novel methods, materials and strategies related to ESP. These sessions often have practical engagements with processes such as designing customised lesson plans for teachers to make the theoretical concepts easily attainable in classrooms (Richards, 2001; Mann, 2005).

Another highly effective model is that of mentoring, which involves experienced ESP educators working with their less professional peers. Both sides can share insights, teaching strategies, and resources in this collaborative relationship where mutual benefit is found. On the other hand, reflective practice beckons educators to critically analyze their own experiences with teaching in order to find opportunities for improvement and innovation (Farrell, 2015).

These models are combined into a larger framework typically, over the long term for professional development efforts. Teachers might, for instance participate in workshops to develop their understanding, engage in ongoing mentoring staff development aimed at engaging them that is contextualized and use reflective journals as milestones. It is all meant to help teachers rapidly change their teaching in relation to the changing needs of students' areas of study.

2.6.3. Enhancement of ESP Teachers Professional Development for Online Pedagogy

Online learning has changed the landscape of teaching English for Specific Purposes (ESP) and proper professional development is therefore needed so that instructors will be capable of online ESP teaching. This change demands that ESP teachers learn a variety of new skills: providing content online, managing classes digitally, and strategies for keeping students engaged from behind a screen.

According to Compton (2009), online language teachers must hold digital know-how that allows them leverage the vast tools and platforms available. ESP training ought to provide ESP educators with strategies for using interactive tools, including video conferencing platforms, collaborative documents and whiteboards, virtual simulations for certain types of activities (e.g. role plays). They let teachers reproduce the real life settings and activities that are crucial for ESP teaching.

When you transfer your teaching online, student engagement in virtual spaces is another essential component of pedagogy. This makes it crucial for professional development programs to think of strategies to keep teachers engaged; these include the use of discussion forums, breakout rooms or gamified learning activities. These techniques help break the isolation students may experience with online courses and promote active participation.

This also ties into the fact that effective professional development for online ESP teaching should engender accessibility and inclusivity. The teacher also needs to value the different skills of each student and wait for those who will find it more difficult to cope with aspects of technology, both in terms of access and ability. Such flexibility calls for lesson planning and assessment approaches that take these factors into consideration. Continuous professional development ensures ESP teachers are equipped to tackle the unique challenges of online pedagogy with high-quality instruction that caters to learners' needs in an ever-more digitized future world.

1.7. Challenges in ESP Teacher Training

There are some major challenges in terms of ESP teacher training, and thus developing a multi-faceted approach is important to equip educators with the know-how needed to address the specific needs associated with SP. Some of the challenges are of lack of resources, diverse levels of teachers subject knowledge and tailoring general language pedagogy to disciplines.

Belcher (2009) indicates that this means ESP teachers need to be experts not only at teaching language, but also in the relevant fields in which their students will be working, such as medicine, law or business. But this also means that contents of these areas need to be taught, and many ESP teachers may not have enough depth of the subject knowledge for effective

teaching in these area. That gap is hard to overcome in creating relevant course content, and meeting students where they are.

The next challenge is the shift from a general language approach to that of ESP. Language teaching (general / specific) methods are predominantly concerned with general language skills and competencies, whereas ESP assumes a more focused use of the language involving vocabulary, discourse structures and professional communication skills. That gap can be difficult for educators to fill, and in particular if they aren't well versed on the substantive material that students are required to master.

Other issues include lack of resources in ESP teacher training programs. You have to pay high and spend time on making special materials, let it be case studies related to industries or involving real texts. Providing continuous professional development opportunities for ESP teachers in some regions that face training limitations can also be a challenge faced by trainers.

Belcher (2009) notes that ESP teacher training programs should address both language instruction and subject-specific knowledge in order to prepare teachers for each challenge. They need the tools to do a proper needs analysis, choose active materials and stay abreast of trends in the industry, so that trainers become process people rather than content deliverers.

1.7.1. Gap Analysis in ESP Teacher Competencies

Gap analysis is an important part of the ESP teacher training needs analysis process, focusing on the identification and targeting of specific skills or knowledge gaps. Gap analysis can be defined as a tool to determine the difference skill of teachers by Tsui (2003) gap refers to difference between what they have and what they need. Within the context of ESP, this would usually involve a lack of knowledge about an area of vocabulary or practice such as conducting a needs analysis.

An ESP teacher teaching engineering students may not know the vocabulary of the field, for instance. This gap can lead to under- or over-instruction on precise skills, which may impair students' ability to communicate effectively in their future careers. Similarly, an ESP teacher who is not proficient in conducting a needs analysis may fail to gather sufficient data on the language requirements of their students, leading to a curriculum that does not adequately meet their needs (Basturkmen, 2010). Likewise, an ESP instructor with little or no expertise of how to conduct a needs analysis will likely receive insufficient information regarding the language needs of his or her students, making it possible for him/her to design the course content in dearth of such need-driven inputs.

Gap analysis helps to identify these weaknesses and can then be used to develop targeted professional development initiatives. This may include technical training in certain industry-specific language or workshops on how to conduct needs analysis (Graves, 2000). These are important initiatives to make sure that ESP teachers are ready to meet students' needs with targeted instruction. Gap analysis places the onus on helping teachers develop their competences so that they will be more able to meet the changing needs of ESP students (Richards & Farrell, 2005).

1.7.2. Pedagogical Challenges for ESP Practitioners

Pedagogical challenges, such as maintaining a balance between elements of linguistic instruction and professional content are widely recognized by ESP practitioners. According to Basturkmen (2010) ESP teachers should not only teach the language but design their courses with content that is specific to the students' fields of study. It also means combining content knowledge with language instruction, which often comes down to a tangle of decisions in the instructional design process.

The first big problem is that the courses must meet the professor's industry or academic standard. A Business English course like this one may need to embody the latest in business practices, financial vocabulary and corporate communication styles. Finding the balance between language appropriateness and professional relevancy takes a lot of forethought in material development and continuous updating (Hyland, 2006).

Another challenge is the use of authentic materials. Although real-world materials including case studies or industry reports are important in equipping students with the tools they need to use English effectively outside of class, such resources can be hard to come by and utilize in the classroom. In addition, they could too be specialized for students who do not have the background knowledge necessary to grasp them, making ESP teachers need to be well versed in both the language and the professional area (Belcher, 2006).

Basturkmen (2010) notes that one way of meeting these challenges is by using people in the industry to guide curriculum design. Working with professionals allows ESP teachers to tailor their courses to current developments in their fields (e.g., trends, terminology, professional practice), and overall provides a more relevant and practical learning experience for students.

The challenges affecting ESP teacher training become even more pronounced when teaching takes place in digital environments. Online instruction introduces additional demands related to interaction, technology use, lesson design, and learner engagement. In this sense, the question of online pedagogy emerges as a natural extension of the broader discussion of teacher preparation and pedagogical difficulty.

1.8. Online Pedagogy in ESP: Transition and Adaptation

Online teaching methodology has presented a new series of pedagogic challenges and opportunities for ESP. Hampel and Stickler (2005) claim that effective pedagogy in online course requires adaptation of traditional methods but also the use of digital impact as an inspirational element.

Flexibility is the main component of online ESP instruction. A component of this is ensuring that students who may be enrolled in classes from different time zones, with varying access to technology and internet connections, have online courses which are adequately prepared for all scenarios. What this means is, asynchronous forms of teaching: pre-recorded lectures and discussion forums and assignments that students can do on their own timelines. Synchronous activities, and/or live webinars or virtual meetings can be used as well if necessary to facilitate real-time interaction and engagement (Anderson, 2008).

In addition, the move to online teaching has accelerated the provision of innovative digital tools and platforms for delivering high-quality instruction by ESP educators. Things like video conferencing software, interactive whiteboards, and collaborative documents mimic the communication and engaging nature of a regular face-to-face class to create a more dynamic learning experience (Comas-Quinn, 2011). In sum, adapting to an online pedagogy involves reimagining the method of learning together with integrating technology; this is crucial for ESP teachers to maintain their effectiveness in virtual classrooms (Stickler & Hampel, 2015).

1.8.1. Definition of Online Pedagogy

Online pedagogy is the design of teaching methods for online learning context. In ESP, this includes the ways that students can be engaged through digital spaces, participatory opportunities and content adjustment to the online format. According to Anderson (2008)

creating an effective online pedagogy cannot be based on a schema derived from the experience of teaching in traditional environments, some understanding is needed both of how digital tools differ in affording instructor intervention, and student interaction, as well as the way interaction can facilitate learning.

This is particularly true for ESP, because online pedagogy allows instructors to continue providing language instruction tailored to their discipline without being limited by the restrictions of geography. Online ESP instruction needs to be synchronised and asynchronised, but the two must complement each other in terms of professional language acquisition (Hockly, 2018). It additionally means that you can mimic workplace communication through real-time simulations, group projects and discussions, and give students access to foundational knowledge through recorded lectures and reading materials.

Moreover, when designing online materials and assessment, there also must be a consideration of language level but perhaps more important the need to get students developing their professional skills. In some cases, assessments may not only be language tests but also real-world work-related tasks like report writing, presentations or contract negotiations (González-Lloret & Ortega, 2014). By conforming these practices, online pedagogy makes certain that the learners of ESP will have developed skills to communicate efficiently in their fields.

1.8.2. The Shift to Online Teaching: Global Context and Local Implications

The sudden shift of the world towards online teaching has impacted universities and the ESP programs in every part of the world, pushing its educators to rethink their strategies accordingly in order to effectively teach in a digital world. According to Means, Bakia, and Murphy (2014), the popularity of online learning provides opportunities but also challenges for

ESP teachers. There is little doubt that, worldwide, the shift to online learning has democratised access to education by providing a platform for students to learn no matter where they live. However, this transformation has also underscored various challenges, including the digital divide: a phenomenon where students in under-resourced areas may lack the essential technology or internet connectivity to fully engage in online learning (UNESCO, 2020).

In the case of Algeria, the transition to online English for Specific Purposes (ESP) instruction has introduced its own unique local challenges. The country's infrastructural limitations; such as inconsistent internet availability and insufficient online teacher training; have posed significant obstacles for both educators and learners (Kerras & Salhi, 2021). Nonetheless, this shift has also catalyzed innovative solutions, like the implementation of mobile learning and blended learning strategies that merge online and traditional in-person components.

Although these hurdles exist, the move toward online ESP instruction presents notable advantages, including enhanced flexibility, access to a wider array of learning resources and the potential to involve students from various geographical regions. Adapting ESP programs to the digital landscape necessitates continuous effort, but it concurrently unveils new avenues for educational innovation (Comas-Quinn, 2011).

1.8.3. Effective Practices in Online ESP Instruction

E-learning ESP teaching is not just about engaging students in the use of interactive and multimedia tools but also wheeling them into simultaneous acquisition of language and professional skills (Hampel and Stickler, 2012). The practice of fully collaborating with the electronic whiteboard is recognized as one of the best practices in ESP online teaching. Online quizzes, discussion forums, and collaborative documents are some examples of these

participatory dynamic tools. They offer quick interactive feedback and foster good relationships among learners and teachers, these technological tools provide learner autonomy. Students can thus communicate both with their peers and their instructors in this mode, imitating the conditions they would face in a professional workplace. For instance, online discussion forums can provide a space for students to discuss industry-specific topics, allowing them to practice their professional language skills in a context relevant to their field.

Another important practice is real-world simulations. ESP instructors with tools such as virtual environments, or via the use cases may elaborate simulations that closely reflect professional settings. This might include simulated meetings in a business English course where students are role-playing a negotiation or collaboration. The exact form they take varies, but all of these simulations allow students to practice far more than just language: they are practicing the kinds of professional behaviors and strategies that they will need in their careers (González-Lloret & Ortega, 2014).

Working on collaborative projects is also an important aspect of ESP teaching online. These projects promote collaboration and communication, similar to how most jobs would be structured. To help students improve their language skills as well as the teamwork skills that will enable them to thrive in the workplace, working on group assignments is better. Through the integration of these practices, ESP educators can ensure that online instruction remains relevant, interactive, and highly applicable to professional contexts.

1.9. Technology Integration in ESP Education

ESP-Language investigation has impacted the connection in between language and human interaction. According to Chapelle and Sauro (2017), ESP teachers facilitate high interactivity, engagement, and personalization of learning experiences with digital tools and

devices. Tech provides a plethora of resources to enrich linguistic courses and professional content.

Specialized software and digital platforms, for example, support educators in a range of functions including providing targeted content, monitoring students' progress, and giving immediate feedback. Using tools like Google Workspace and Padlet, instructors can design collaborative learning spaces in which students are able to discuss ideas, share information and resources and work on projects together. Moreover, by using contextually relevant materials we can teach different specialized vocabulary, language functions, and communication styles designed for specific industries, further aligning the course content with students' professional needs.

In addition, English for Specific Purposes situations can be made more lively by the creation of multimedia resources and simulations during this phase. Videos, podcasts, and interactive modules, for example, can expose students to real-world situations in which they can develop both their language skills and professional competence (Reinders & White, 2011). This not only facilitates language learning but also equips students with tools for real-life professional contexts through authentic materials. In summary, the incorporation of technology leads to more flexibility and efficiency in ESP teaching, which opens up personalisation but also accessibility to a wider range of opportunities for students while maintaining student engagement with their professional content.

1.9.1. Digital Tools and Platforms for ESP Teaching

Digital tools and platforms have formed an essential part of every diaspora nowadays bringing forth the in-hand syllabus inside ESP teaching especially with respect to content delivery and student engagement. As it has been emphasized by Thomas, Reinders and

Warschauer (2013), platforms such as Learning Management Systems (LMS) have provided fundamental changes in the era of language education, which facilitate the delivery of tailored content and provide avenues for student-teacher interaction outside the traditional classroom.

As an illustration, LMSs like Moodle or Blackboard provide ESP instructors with the ability to create course material and assess student progress. These systems allow teachers to provide in one place all types of content from reading and video lectures to practice work problems and submitting homework assignments. Tutors may arrange content digitally, making it convenient for students to access materials and learn at their ease. Likewise, language apps and tools focused on a particular sector provide students with targeted practice that meets their career requirements (Godwin-Jones, 2014). The business English apps will certainly emphasize specialized vocabulary, allowing students to practice together: for example, apps that focus on finance vocabulary, marketing terminology or human resources language; thus also helping students to understand typical conventions of writing and speaking during their field.

ESP teaching may be further enriched by tools like Google Workspace and Padlet, which prepare the basis for teamwork and language exchange. The best of these tools enable learners to share documents, discuss ideas in real-time, and collaborate on projects, by providing an opportunity for all the components of teamwork and communication that are so critical in their professional environments (Comas-Quinn, 2011). Utilizing these digital tools and platforms enables ESP teachers to create interaction-focused, adaptable, and student-driven learning opportunities that address the needs of language development as well as workplace preparation.

1.9.2. E-learning and Blended Learning Approaches in ESP

Such method of education, e-learning and blended learning approaches are also an inseparable constituent in ESP education since they provide learners with good access to more flexible and personalized learning experience. According to Graham (2006), blended learning is a combination of traditional face-to-face teaching and online resources, which captures the benefits that either learning environment can provide students.

Blended learning is especially useful in ESP because it enables the combination of content relevant to their profession with language instruction. Ex: Students might be exposed to some online content (e.g. recorded lectures, specialized reading materials) while being actively involved in other face-to-face components of the program that promote language use in a professional context. This creates an opportunity for a change of pace and better variety in how that learning is experienced.

In contrast, e-learning platforms allow students to study at their own speed and tap resources as and when required. For instance, people learning English for aviation might interact with online practice of air traffic control to apply professional vocabulary and communication methods. These platforms offer the flexibility to pursue studies at your own pace, which gives learners more control of their educational journey.

The use of blended and e-learning steps also allows for personalized learning. With online modules, students can move at their own pace through what they need to learn and on to demonstrating mastery of competencies. Due to the various learning needs of students, this flexibility in ESP ensures that students undergo an effective and engaging way of learning. In conclusion, blended and e-learning approaches guarantee the relevance of ESP education by accommodating it into students professional fields.

Technology integration plays an important role in shaping contemporary ESP teaching, but its value depends on how it is embedded within a coherent pedagogical framework. This leads directly to the issue of curriculum development, particularly in online contexts where structure, sequencing, accessibility, and professional relevance must be carefully balanced.

1.10. Curriculum Development for Online ESP Programs

Creating a curriculum for online English for Specific Purposes (ESP) programs requires both adjusting existing course frameworks to a virtual medium and considering the specific demographic of ESP learners. In short, an online ESP syllabus should base learners and their professional goals (Nation & Macalister, Farajnezhad, 2022) on skills in using the language for communication purposes which are required in certain work fields. In contrast to general English language programmes, an ESP curriculum is designed specifically to teach the various means and genres of communication required in the student, pupils or employee's workplace area. There are different key points to keep in mind while doing this process, like the course design or format and assessment approach, and use of technology.

As Nation and Macalister (2022) point out, Flexibility in designing curriculum is essential because learners need to be able to study at their own pace, without the pressure of meeting deadlines imposed by teaching programmes. That kind of flexibility is important in the online space, where students could have a large schedule gap between different time zones. To cater various learning styles, online ESP programs need to implement a combination of synchronous and asynchronous components. These async activities, reading, listening exercises and online discussion forum, give students some flexibility whereas the sync ones like live webinar or real-time peer interactions promote engagement & grow a community of learners.

Another key point in this respect in designing an online ESP syllabus is integration with digital tools. Nation and Macalister (2022) also talk about ways in which technology can be utilized for interactive and experiential learning. Digital platforms can include content delivery, progress tracking, and communication tools such as Learning Management Systems (LMS). With the help of tools such as video conferencing, learners can attend live lessons and take part in speaking and listening practice. Furthermore, authentic materials like genuine industry reports or technical manuals can be incorporated into the curriculum as well as professional scenarios to stimulate a practical learning experience and make sure students are exposed to the language used in their specific field.

Assessment methods are also a central part of analysis online curriculum for ESP development. Assessments should assess tasks that learners will carry-out in their work-settings. Such assessment tasks like project reports, presentations or case studies, for instance, are used to evaluate how students apply their language skills in realistic professional environments. Learners have time to grow and develop skills over time through use of formative assessments, like peer reviews and self-assessments. Exams or final projects recognized as summative assessments burrow deeper to gauge competency in applying the industry-relevant professional language.

Designing an online ESP curriculum is to build a flexible atmosphere that promotes interest and motivation in the classroom which bridges the gap between academic and professional settings within different professional fields. Implementing structure, technology integration and assessment to help your students become proficient in the curriculum while developing professional skills needed for success.

The literature on online ESP curriculum development shows that flexibility, technology, and authenticity are all important, but only when they are organized around

communicative purpose. This again reinforces the significance of teacher preparation. Online ESP curricula do not design themselves; they depend on teachers who can interpret needs, select appropriate tools, adapt authentic materials, and align assessment with professional standards. This strengthens the rationale for examining teacher professional development as a key condition for effective online ESP delivery.

1.10.1. Designing ESP Curricula for Online Delivery

Adapting traditional methodologies to the online classroom in designing ESP curricula certainly require an extensive consideration of issues. Richards (2001) emphasizes that online ESP courses should focus on providing clarity, accessibility, and interactivity so that learners can maximize the learning from the online courses. Moreover, in a digital context the participants need to have an easy time finding their way around course content, grasping what learning outcomes they are referred to and engaging in discussions and tasks. So, when designing a course and making use of tech for workshops, teachers must always keep in mind the specific needs of ESP learners (Hampel & Stickler, 2005; Salmon, 2000).

It is extremely useful to have multimedia resources that complement online ESP curricula. An interspersing the course with different types of media such as video clips, podcasts and interactive modules enables learners to interact with the content through various mediums. An example would be if the content is for healthcare professionals, there might be an instructional video about medical terminology, patient interviews, or diagnostic procedures. These multimedia resources are examples of genuine language use in their professional area which also allows learners the time to practice listening and comprehending. Also, multimedia aids in creating clarity to detail-heavy information so the learners can comprehend central ideas more easily (Mayer, 2009; Herrington, Oliver, & Reeves, 2003).

Real-time interaction is another component besides multimedia which is essential in an online ESP course. Online ESP courses should have synchronous elements; online components; such as live webinars or video conferencing, where learners meet up with students and teachers on present time. These interactions provide the communication contexts that ESP learners will need in real world situations. Say in a Business English course, students can take part in live mock meetings or negotiations and therefore practice communication skills. By providing students the opportunity for real-time interaction, it not only strengthens their language skills but also creates a community among students in the course which is sometimes not established as much in fully asynchronous online courses (Hrastinski, 2008; Yanguas, 2010).

Real materials are arguably another main aspect of online ESP curricular design. Additions that ESP courses should make the learners familiar with authentic contents and samples based on a particular situation where the specific language is utilised. In an online course for engineers, for instance, students could be reading blueprints, project reports and safety manuals; documents created within that very industry. Such real-life materials not only assist learners in mastering the area specific jargon and communication behaviors but also help align the course content to appropriate industry expectations (Gilmore, 2007; Hyland, 2006; Mishan, 2005).

Designing ESP courses via online mode should be implemented by creating multimedia supports with real-time interaction between students and instructor, while taking into account that practitioners are using authentic materials to equip their students with concepts of the subjects in a way as effectively engaging. Educators can help their students to be able to navigate and excel in the professional world by ensuring that online teaching provides clear content, is easily accessible, and interactive.

1.10.2. Aligning ESP Curricula with Professional Standards

One of the crucial objectives in ESP is meeting the professional standards which, appropriately, allows students to be prepared for the real-life use of language. According to Brown (1995), the content of an ESP based curriculum should closely match the language use, communication and vocabulary in industries supported by such programs. Such alignment ensures that students gain skills directly transferrable into professional environments, helping to increase their employability and competency.

Industry cooperation is thus needed in order to match a viable ESP curriculum with professional standards. According to Brown (1995), it is obligatory for course designers to collaborate with professionals of the field to recognize the most powerful and relevant language skills necessary for success. This partnership guarantees that the training reflects real industry terminology and practices. An ESP course for use by business professionals, for example, may include material such that used in financial reports, company communications and industry specific terminology (Anthony, 2018; Dudley-Evans & St John, 1998).

The use of jargon is one of the important rules for correlating ESP courses with professional standards. ESP learners need to get acquainted with the usage of language in their specific area, including but not limited to the specialized vocabulary, phrases, and expressions used. In disciplines such as law, medicine, or engineering the language can be very specialized and ESP courses should concentrate on developing the learners understanding and production of communication in the relevant register (Flowerdew, 2013). Through authentic materials and real-world examples, ESP courses can teach students the language required to succeed in their professional contexts.

The role of assessment methods in aligning ESP curricula with professional standards, assessments should be constructed to parallel the key activities of the relevant domain. Assessment in a law ESP course, as an example, may focus on writing legal papers, completing a mock trial or examining certain case studies. The assessments reflect their language proficiency as well as validating their ability to perform actual tasks associated with their job (Douglas, 2000; Chan, 2018).

Aligning ESP curricula with professional standards can include consulting professionals, inputting specialized vocabulary and formulating assessments that achieve tasks in the workplace. This alignment assures that the learners will be introduced with those language skills, which are essential to qualify them for their career.

1.11. Assessing ESP Teacher Performance and Learning Outcomes

Teacher performance and learning outcomes assessment on English for specific purposes (ESP) is, without doubt, essential to help keep the programs relevant and effective. Teaching ESP requires a combination of teaching and domain specific expertise. According to Bachman and Palmer (1996), assessment in this case should assess not only whether teachers can deliver specialized content successfully, but also whether they have caused students to engage with their learning and shaped teaching strategies in ways that reflect industry-specific needs (Graves, 2008; Hutchinson & Waters, 1987). Conversely, measuring student learning outcomes is about the hands-on skills necessary for effective communication as professionals in their fields.

The degree of adaptability of instruction to the changing needs of ESP learners is usually one aspect that normally gets consideration in assessing teacher performance. This includes checking for classroom management, use of real materials and creative

methodologies. In addition, teachers should prove their ability to stimulate learners and create a learning environment where the situations are as close as possible to real-life communication. An aviation instructor has to teach professionals so in using those terms and situations with specific communication; in case of emergencies (Basturkmen, 2014; Sifakis, 2003).

In ESP, student learning outcomes refer to learners ability to use language skills in a professional context and emphasize practical competency rather than theoretical knowledge. Simulations, role plays and project-oriented activities that are designed to mirror real-world problems (Bachman & Palmer, 1996) may be used for assessments. For example, students may write contracts in a legal ESP class or make arguments to prove a case; their use of the language functions through these samples is clearly within the methods and conventions of their fields. Always ongoing teacher performance assessment and learning outcomes guarantee ESP programs stay in the line of approved practice, progressing along with the requirements from professions to education as well as changes in technology and capabilities.

1.11.1. Assessment Methods for Online ESP Teaching

Strategies of assessment tools and practices in online ESP teaching that should be effective must aim to connect the instruction of language with its use in real-life professional practice. Douglas (2012) emphasises both formative and summative aspects to assess progress and competence. Online spaces are different from in-person environments, which means we need to do things differently when going virtual (Reinders & White, 2011).

Performance-based tasks are central to online ESP assessment, where students are given practical nature of exercise responsible for their professions. As a case in point, a student taking an ESP course for the health industry might read and thoroughly analyse a single case and then hand in just as they would perform on the job: handwriting up a written report that outlines

their diagnosis. The performance tasks gauge students on how well they can use the language skills in their discipline. Another useful tool in Online ESP programs are portfolio assessments. Students can use them to put together their work throughout the course and provide a complete picture of learning. The portfolios may contain written reports, recorded presentations, and peer-reviewed projects to provide information about both their growth and weaknesses (Hamp-Lyons & Condon, 2000; Cheng & Fox, 2017).

Providing a room to the learners that they can reflect on their own performance and peers performance in order to learn collaboratively. These methodologies enable students to reflect on their work and contribute feedback to the compromise of peers, which is said to promote critical thinking and communication skills at a professional level. Such varied approaches guarantee that online ESP assessments are thorough and aligned with students professional objectives, allowing instructors to attune themselves as per their shifting requirements.

1.11.2. Evaluating Teacher Professional Growth

Assessing professional development of ESP teachers is critical to sustain the quality of programs and address the need for specialized language educators. According to Richards and Farrell (2005), these evaluations should be focused on future developments, flexibility and a more innovative approach. First, professional growth assessments are often targeted within the context of how teachers are able to understand and meet the needs for language in specific industries. Educators are assessed upon their ability to incorporate real-world application into their curriculum, providing students with skills that can be used in the workforce. An ESP teacher teaching IT professional, for example, needs to be aware of the rapid development of technology and its related terms.

Yet another key element of teacher development is their ability to adapt to new methodologies. As we become more dependent on digital platforms, teachers need to prove their proficiency in online teaching. Cheers to the ever-evolving ESP education, these days, Training in Learning Management systems (LMS), multimedia resources and what nots are included (Compton, 2009; Kessler, 2018).

The preceding section addressed assessment as a key dimension of ESP teaching and teacher development. To deepen this discussion, it is useful to examine how ESP teacher development has been approached in practice across different educational contexts. International case studies offer valuable insight into both recurring challenges and effective responses.

1.12. Case Studies in ESP Teacher Development Worldwide

Global case studies in ESP teacher development reveal both common challenges and context-specific innovations. Research from various regions underscores that ESP teachers require specialized training distinct from general English teacher education. For instance, a historical review of major ESP teacher training programs worldwide highlighted a persistent lack of formal ESP teacher preparation and the need for special competencies in areas like needs analysis and content-based pedagogy. In developing contexts, this gap is especially acute – one survey in West Africa found that few university curricula include ESP teacher education, leaving instructors underprepared for industry-specific communication demands. Nonetheless, several case studies show institutions responding with targeted programs to build ESP teaching capacity. These cases provide insight into effective strategies for teacher development, from pre-service training courses to in-service professional development initiatives.

Early and recent case studies converge on the importance of multi-faceted skill development for ESP instructors. ESP teachers are expected to fulfil diverse roles, acting not only as language instructors but also as course designers, needs analysts, materials developers, and even researchers of specialist discourse. Dudley-Evans and St. John's classic framework describes the ESP practitioner as a "*teacher, collaborator, course designer and materials provider, researcher, and evaluator*," emphasizing the broad expertise needed in this field. Belcher (2006) similarly noted that ESP teachers are often "needs analysts first and foremost, then designers and implementers of specialized curricula". Reflecting these expectations, case studies from around the world (e.g., in Europe, the Middle East, and Asia) document how ESP teacher development programs strive to equip teachers with content-specific knowledge and methodological skills beyond general ELT training. For example, an ESP teacher education initiative in Turkey integrated training on conducting needs assessments, designing field-specific materials, and collaborating with subject specialists, significantly broadening pre-service teachers' skill sets. Across diverse contexts, successful ESP teacher development projects tend to share an emphasis on contextual relevance – tailoring training to the specific professional domains of learners – and on bridging the gap between theory and practice through hands-on projects and reflective practice.

Furthermore, Menaceur and Bouabdallah-Haddam (2023) explored the potential of popular media in EMP courses through a case study on the TV series *House*, demonstrating how medical vocabulary acquisition can be facilitated through contextualized, audiovisual input. Their findings emphasized student engagement, the authenticity of terminology, and the motivational impact of popular culture integration, aligning with the broader shift toward media-enhanced ESP pedagogy.

1.12.1. Successful Online ESP Teacher Training Programs

One notable trend in ESP teacher development is the rise of online training programs that reach practitioners globally. Several case studies report successful implementation of online ESP teacher education courses, which offer flexible, needs-oriented training for in-service teachers. For instance, the Reflective Teacher Education in ESP (ReTEESP Online) program described by Kakoulli Constantinou and Papadima-Sophocleous was developed as an action-research driven online course to address the needs of 24 ESP instructors across different technical disciplines. The curriculum of ReTEESP was explicitly informed by current ESP pedagogy research and a thorough needs analysis of the participants, ensuring that content was aligned with teachers' professional requirements. Key topics such as characteristics of ESP, the primacy of needs analysis, authenticity in materials, and the complex role of the ESP practitioner were all incorporated, alongside training in the latest digital tools for teaching. This alignment with established principles of online teacher education (e.g. promoting collaboration, reflection, and practical application) contributed to the program's success. Participants in the ReTEESP case reported gains in both theoretical understanding and practical skills, and the pilot implementation yielded positive outcomes, including improved confidence in designing ESP courses and materials. This illustrates how carefully designed online programs can overcome geographical barriers and provide ESP-specific pedagogical development at scale.

Another example of an effective online ESP teacher training effort is the integration of blended learning and personal learning environments in Asia. In one exploratory study in China, a university piloted a learning management system combined with a personal learning environment for ESP teacher training, enabling teachers to individualize their learning path while also engaging in a community of practice (Xu, 2018). Such platforms facilitate ongoing

professional learning by providing access to digital resources, discussion forums, and feedback channels, which is especially valuable given that opportunities for ESP-focused professional development are often limited. Case studies from Europe and the Middle East likewise highlight the success of online workshops and webinars targeted at ESP instructors – for example, an online teacher development series for Business English instructors in Spain led to the creation of teacher-developed case-study materials that were directly applicable to their classes (Farmati, Yeou & Benzehaf, 2023). Across these cases, common factors for success include:

- (1) a needs-driven curriculum (identifying what specific skills or knowledge teachers lack and addressing those gaps),
- (2) incorporation of authentic ESP tasks and projects (such as designing a module for a real occupational context during the course)
- (3) leveraging social learning through peer discussion and collaboration online.

By following established best practices in online teacher education design (e.g. scaffolding learning, fostering interactivity, and providing mentoring feedback), these programs demonstrate that online platforms can effectively build ESP teaching competencies. The flexibility of online delivery also allows wider participation – teachers from various regions and backgrounds can enroll, fostering a global exchange of ESP teaching strategies. In sum, effective online ESP teacher training programs combine research-based curriculum design with interactive technologies to support teacher learning, and case studies worldwide attest to their positive impact on teacher preparedness in ESP contexts.

1.12.2. Challenges and Solutions in ESP Teacher Development: Global Perspectives

While progress is evident, literature from diverse contexts reveals recurring challenges in ESP teacher development, as well as creative solutions tailored to local needs. A dominant challenge reported globally is the inadequacy of formal training for ESP practitioners. Many ESP teachers enter the role as general English instructors suddenly tasked with teaching technical content, leading to insufficient subject-matter knowledge and a lack of confidence. For example, qualitative studies in Turkey, Estonia, and Indonesia have all documented that teachers feel unprepared in the specialized content of their ESP domain and often have *no specific training* in ESP methodology. Teachers in these studies cited low content knowledge, absence of needs-analysis training, and unfamiliarity with genre-specific pedagogy as major hurdles in effectively delivering ESP courses. Compounding this, ESP instructors frequently work in isolation without mentorship or collaboration with subject experts, which leads to what Meristo and López Arias (2021) call “instability” in ESP course implementation and a sense of professional isolation. Large class sizes and mixed-ability groups – common in university ESP settings – present additional contextual challenges, as noted in an Indonesian case, making it difficult to provide specialized attention to all learners.

On the whole, as Basturkmen (2019) observes, the multifaceted knowledge base required for ESP (language pedagogy *and* subject content) can appear “excessive and complex” to teachers without adequate support. These challenges are not confined to any one region but echo worldwide: a review of ESP teachers’ experiences in Spain, Turkey, China, and beyond found that teachers’ professional needs are strikingly similar across contexts, centering on content expertise, course design skills, and collaboration opportunities. Notably, one aspect that is *less* often seen as a challenge is English proficiency itself – in cases where ESP is taught by experienced EFL teachers, they generally report confidence in their language ability, instead

emphasizing needs for subject-specific training and resources. This underscores that the primary gaps are in specialized pedagogical knowledge rather than general language skills.

In response to these challenges, a number of solutions and best practices have emerged globally. A key strategy is strengthening interdisciplinary collaboration. Research indicates that when ESP teachers partner with subject specialists or content faculty, it can greatly mitigate the content knowledge gap and improve course relevance. For instance, Woźniak's (2017) longitudinal study in Spain described a collaboration where EAP instructors (with ELT background) served as "content-language support" alongside engineering faculty in a CLIL program, working together on needs analysis, materials design, and team-teaching; this resulted in more contextually accurate language instruction and mutual learning between language and content teachers. Similarly, Jitpaiboon and Sripicharn (2022) document a collaborative model in Thailand in which ESP teachers regularly consulted domain experts (in science and business fields) when developing course modules, which enhanced the teachers' confidence in technical content and produced materials better aligned with industry practices. These examples illustrate the solution of treating ESP teaching as a *team effort*, rather than leaving language teachers to operate in isolation.

Another widely recommended solution is expanding professional development (PD) opportunities that are tailored to ESP. Institutions are beginning to offer in-service training workshops focusing on ESP curriculum design, genre analysis, and digital tool use for specific purposes. For example, in Turkey a competency-based ESP teacher development program identified priorities such as training in higher-order thinking skills facilitation, designing appropriate ESP materials, and mastering ESP-specific pedagogical strategies. Providing such targeted PD not only builds skills but also addresses the low self-efficacy many ESP teachers report – Bayram and Canaran (2020) found that novice ESP instructors felt insecure about

performing ESP tasks solo, but with ongoing training and especially peer or mentor support, their self-efficacy improved markedly.

Institutional support is also crucial in implementing solutions. Administrative measures like reducing oversized ESP classes, allotting time for materials development, and recognizing ESP teaching in faculty workload can alleviate some challenges (Basturkmen, 2014). Jiang et al. (2018), in a study of hundreds of novice ESP teachers in China, noted that strong institutional backing (e.g. funding for course materials, clear curricular guidelines, and supportive policies) was positively correlated with effective ESP course delivery. On the assessment front, the push towards digital learning has revealed the need for clear frameworks: a large-scale Indonesian study on online formative assessment in ESP reported that without official guidelines or standards for evaluation, teachers struggled to integrate assessment into teaching, highlighting the solution of establishing clear assessment policies and training in using digital assessment tools. Finally, communities of practice and reflective networks among ESP teachers are emerging as a grassroots solution to share knowledge and sustain growth.

Studies from Iran and Vietnam describe how creating forums (both online and face-to-face) for ESP instructors to exchange materials, discuss challenges, and mentor each other leads to increased professional confidence and adoption of innovative practices (Farahani & Parhamnia, 2021; Tung, 2018). In sum, global perspectives suggest that the challenges in ESP teacher development – lack of specialized training, content-knowledge gaps, isolation, and contextual constraints – can be effectively addressed through collaborative, well-supported, and research-informed initiatives. By investing in targeted training, fostering collaboration across disciplines, and building supportive teacher communities, institutions around the world are beginning to close the gap between the demands of ESP and the preparation of its teachers.

The international literature suggests that the challenges facing ESP teacher development are recurrent across contexts, particularly in relation to content knowledge gaps, limited specialized preparation, professional isolation, and insufficient institutional support. At the same time, the reviewed studies indicate that these challenges can be addressed through targeted professional development, interdisciplinary collaboration, structured mentoring, and communities of practice. However, most of these solutions are documented in contexts with institutional arrangements, support systems, and policy environments that differ from those of Algerian higher education. For that reason, the present study does not assume direct transferability. Instead, it draws on these international insights while examining how a context-sensitive intervention may function within the specific realities of Algerian university ESP teaching.

The case studies reviewed above show that ESP teacher development is shaped by a combination of contextual constraints, institutional support, and pedagogical innovation. Building on these practical insights, the discussion can now move toward recent innovations and future directions in the field, particularly those that may influence the continuing development of ESP pedagogy and teacher education.

1.13. Innovations and Future Directions in ESP

Looking ahead, the field of ESP is experiencing dynamic shifts in both pedagogical approaches and teacher training models. Innovations are being driven by changes in global workplace communication needs, advancements in educational technology, and a growing body of ESP research that links theory with practice. Indeed, scholars note that after decades of ESP focusing mainly on linguistic features and learners' needs, there is now a renewed emphasis on the role of research and innovation in informing teaching practices. Tensions have historically existed between practitioners and researchers in ESP (with teachers sometimes

viewing research as abstract, and researchers finding classroom practice under-theorized). However, the current consensus is that bridging this gap is vital: *“the time seems ripe to revisit the link between research, teaching, and learning in ESP contexts,”* as one overview put it.

This shift in mindset is guiding future directions for ESP teacher development. We can anticipate a more evidence-based, technology-enhanced, and collaborative approach to ESP education moving forward. Three interrelated areas stand out in recent literature: emerging trends in ESP teaching methodology, the expanding role of research in ESP teacher education, and innovative modes of online professional development for ESP educators. These areas represent the cutting edge of ESP and provide a roadmap for how ESP instructors can be prepared and supported in the coming years.

1.13.1. Emerging Trends in ESP Methodology

Methodological innovations in ESP are continually evolving to meet learners’ specific needs and to exploit new teaching tools. One clear trend is the adoption of genre-based and discourse-specific pedagogies tailored to local contexts. For example, Li et al. (2020) describe a “localized genre-based pedagogy” for academic ESP courses in China, wherein teachers guide students through inductive, discovery-based analysis of discipline-specific texts and then develop communicative tasks using local resources. Such an approach moves beyond generic materials by integrating students’ actual professional or academic genres into the classroom. The reported outcome was the creation of a common ground between ESP learning and the target discourse community, as students practiced writing and communication tasks truly authentic to their field. Active learning strategies have also gained prominence in ESP methodology. In contrast to traditional lecture-oriented teaching, ESP instructors are increasingly employing student-centered techniques like problem-based learning, simulations, and project work that mirror real-life tasks. A qualitative study by Nguyen et al. (2022) in

Vietnam showed a significant pedagogical shift among ESP teachers from teacher-centered methods to active learning paradigms. Teachers in the study facilitated interactive activities (role-plays, case analyses, etc.) and reported that this shift not only heightened student engagement but also changed the teachers' own perception of their role. They saw themselves less as transmitters of specialized knowledge and more as facilitators or coaches, guiding learners to use English in realistic professional scenarios. Notably, the introduction of active, task-based learning correlates with improved teacher confidence: when teachers incorporate simulations or collaborative problem-solving tasks, they find that students take more ownership, which in turn *"helped increase teachers' self-efficacy to teach subject content not in their area of specialization"*. In other words, an active learning approach can reduce the strain instructors feel about their limited content expertise, as the focus shifts to facilitating student inquiry and communication practice.

Another emerging dimension is the attention to teachers' cognitive and emotional engagement in methodology. Recent research acknowledges that how teachers teach ESP is influenced by their beliefs, identity, and even emotional states. Zhao et al. (2022), for instance, investigated ESP teachers' pedagogical decision-making in China and found that teachers' emotions – including expectations, empathy, and frustration – significantly shaped their teaching choices. Strict institutional policies (like rigid assessment regimes or large administrative loads) sometimes led teachers to distance themselves from institutional goals, indicating a need for methodologies that allow more teacher autonomy and creativity. This line of inquiry suggests future ESP methodology will not be one-size-fits-all; instead, effective teaching practices must be adaptable to teachers' local contexts and supportive of teacher agency. As teachers become more reflexive practitioners (often through action research or professional learning communities), they can experiment with blending approaches – for

example, combining a genre-based framework with task-based learning or CLIL (Content and Language Integrated Learning) techniques – to find what works best for their students.

The literature also highlights the role of technology in emerging ESP methods, such as using corpora for teaching specialized vocabulary, or virtual simulations for practicing professional communication. Integrating technology is not just an add-on but is shaping methodology itself: teachers now design activities like email writing simulations in business English where students interact in a virtual professional environment. These simulation-based tasks, supported by online discussion forums or virtual reality scenarios, provide immersive practice and reflect a trend of aligning ESP teaching closely with the digital communication modes of the workplace. As one pedagogical principle advises, “*immersing the learner in a real-world situation*” via simulation can significantly boost engagement and practical skill transfer. Consequently, ESP methodology is moving toward a more experiential learning model – learning by doing – whether through case studies, simulations, field projects, or the use of authentic digital communication tools.

In summary, emerging trends in ESP methodology emphasize authenticity, learner-centered interaction, and adaptability. Approaches like localized genre pedagogy and active learning are empowering students to engage with real-world content, while also empowering teachers by increasing their confidence and aligning teaching styles with their context. The incorporation of research-driven techniques (e.g., corpus analysis for teaching specialized vocabulary) and technology-enhanced tasks is making ESP instruction more effective and relevant to learners’ future workplaces. As these trends continue, ESP teachers will need corresponding training to master these innovative methodologies – an area where research and teacher education intersect, as discussed next.

1.13.2. The Role of Research in Advancing ESP Teacher Training

Research plays a pivotal role in advancing ESP teacher development, ensuring that instructional practices are grounded in evidence and continuously improved. One aspect of this is the way applied linguistics and TESOL research findings inform teacher training curricula. Over the past decade, scholarship in top journals has begun to focus explicitly on ESP teachers – their beliefs, needs, and professional growth – after a long period in which learners and linguistic content dominated ESP research. For example, Basturkmen (2019) argues that teaching ESP entails a range of specialist tasks (from needs analysis to materials writing) that traditional teacher education programs seldom address. By systematically investigating what experienced ESP/EAP teachers do and struggle with, research has identified critical training needs. A plenary review by Basturkmen (2019) surveyed practices of veteran ESP teachers and found consistent calls for development in areas like pedagogical content knowledge (how to teach language within a specific discipline), assessment literacy for specialized contexts, and managing the dual identities of language teacher and subject liaison. These insights directly feed into the design of teacher education programs: for instance, universities have started incorporating modules on conducting genre analysis and needs assessments into TESOL graduate programs, acknowledging that future ESP teachers must be equipped to perform these research-like tasks (Harding, 2007; Paltridge & Starfield, 2013). In essence, research has spotlighted the “*learning and knowledge needs of teachers*” alongside learner needs, thereby broadening the scope of ESP teacher education.

Another crucial role of research is in developing frameworks and models that guide teacher training. Recent studies propose competency frameworks specific to ESP. One mixed-method study in Turkey used the Competency Framework for EAP/ESP Teachers to assess novice instructors’ needs, revealing five key domains for training: collaboration with content

faculty, fostering higher-order thinking, material design, ESP pedagogy, and ongoing professional development. Such frameworks, grounded in empirical research, offer structured targets for teacher training programs and help evaluate teacher growth. Similarly, research on teacher cognition in ESP (e.g., investigating how teachers adapt general ELT methods to specialized settings) has led to models of teacher identity development in ESP. Teachers often have to negotiate a balance between being language experts and quasi-subject experts, which can be disorienting at first. Studies like Tao and Gao (2017) on ESP teacher identity formation inform teacher education by encouraging reflective practice and identity work as part of training – helping teachers construct a professional self that confidently straddles both language teaching and the specialized field. Incorporating these findings, some teacher development courses now include reflective journals or identity-mapping exercises for teachers to articulate their evolving role.

Perhaps the most direct way research advances ESP teacher development is through action research and teacher-led inquiry. There is growing advocacy for ESP teachers to engage in classroom-based research – for example, conducting their own needs analysis of students or evaluating the effectiveness of a new teaching material – as part of their professional development. This approach, sometimes called *teacher-research*, turns practitioners into investigators of their context. By learning research skills (formulating questions, gathering data from students or industry partners, analyzing outcomes), teachers not only contribute to the knowledge base but also become more reflective and effective in their practice. For instance, an ESP teacher development program in Slovenia had trainees carry out mini research projects (needs analysis, genre analysis, etc.) in local companies and then design teaching units based on their findings. Interviews with the trainees showed that this experience enhanced their confidence and ability to design courses grounded in real needs, embodying Stenhouse's ideal of teachers as curriculum researchers.

Additionally, larger-scale research projects, such as the 2010–2022 systematic review by Supunya (2023), provide macro-level guidance by synthesizing trends across many studies. Supunya’s review identifies seven lines of ESP teacher research – including teachers’ perceptions, challenges, collaboration, and technology use – and even addresses sustainability of ESP teaching by recommending policy and administrative support. These findings encourage educational authorities and organizations (like TESOL and IATEFL) to develop more sustainable training initiatives (e.g., continuous professional learning communities, certification programs in ESP). In summary, research ensures that ESP teacher development is not left to ad-hoc efforts or intuition alone; it provides a tested knowledge base and innovative models that keep teacher education responsive to the evolving landscape of ESP. Going forward, the synergy between research and practice – with teachers both consuming research and contributing to it – is expected to deepen, thereby continually advancing the effectiveness of ESP instruction.

Research contributes to ESP teacher development by identifying teacher needs, proposing competency frameworks, and encouraging teacher inquiry into local practice. It also broadens the field by shifting attention from learners and materials alone to the professional learning of teachers themselves. For the present study, this is particularly important because it supports the use of a needs-based and action-oriented design. At the same time, the literature shows that research is most useful when it is translated into context-sensitive teacher education rather than treated as an abstract body of knowledge.

1.13.3. Conceptual Framework and Research Gap

The literature reviewed in this chapter provides four interrelated foundations for the present study. First, needs analysis remains central to ESP because it enables the identification of the linguistic, pedagogical, and contextual demands that shape effective teaching. In the

present research, this principle extends from learner needs to teacher development needs, particularly in relation to online pedagogy. Second, teacher competency indicates that effective teaching in digital environments requires the integration of content knowledge, pedagogy, and technology rather than the isolated acquisition of technical skills. In this respect, the TPACK framework offers a useful lens for understanding the knowledge domains involved in online ESP teaching. Third, research on reflective practice and action research suggests that teacher learning is strengthened when teachers engage in cycles of diagnosis, intervention, reflection, and adaptation. Fourth, communities of practice provide an important perspective on how professional development may be sustained beyond individual workshops through collegial exchange, collaborative problem-solving, and shared pedagogical inquiry.

Although the literature on ESP, teacher professional development, and online pedagogy has expanded considerably, several gaps remain. First, much of the existing scholarship focuses more extensively on ESP learners, syllabus design, and materials development than on the professional development of in-service ESP teachers. Second, studies of online pedagogy often address general language teaching or broader educational technology contexts, without adequately accounting for the specific pedagogical demands of ESP. Third, relatively limited empirical research has examined these issues in Algerian higher education, where linguistic policy shifts, institutional constraints, and uneven digital conditions create a distinctive environment for teacher development. The present study addresses this gap by examining how a needs-based professional development intervention can support in-service ESP teachers in developing online pedagogical competence within the Algerian university context.

1.14. Conclusion

This chapter has reviewed the major bodies of literature relevant to the present study, including the historical development and theoretical foundations of ESP, the Algerian language

policy context, teacher competency and professional development, online pedagogy, technology integration, curriculum development, and recent international developments in ESP teacher education. The review has shown that ESP is a needs-based, context-sensitive field that requires teachers to combine linguistic awareness, pedagogical flexibility, and responsiveness to disciplinary demands. It has also shown that online pedagogy requires more than technical familiarity with digital tools; it involves the redesign of interaction, feedback, learner support, and instructional sequencing in virtual environments.

At the same time, the chapter has identified an important gap in the literature. While scholarship on ESP and online teaching is substantial, less attention has been given to the professional development of in-service ESP teachers in contexts such as Algerian higher education, where digital transformation, linguistic policy change, and institutional constraints intersect. This gap justifies the present study and supports the need for a research design capable of both diagnosing teachers' needs and examining the effects of a targeted intervention. The next chapter therefore presents the methodological framework adopted to investigate this problem.

CHAPTER TWO

RESEARCH METHODS

AND PROCEDURES

CHAPTER TWO: RESEARCH METHODS AND PROCEDURES

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2.6. Conclusion

2.1. Introduction

While the preceding chapters introduced the research problem and reviewed literature on English for Specific Purposes (ESP), online pedagogy, and teacher professional development, this chapter details the research design and procedures employed to investigate how ESP teachers' professional development for online pedagogy can be improved. It outlines the overall research methodology, the sampling process, and the data collection and analysis methods used.

The research project is described in chronological phases (pre-training, training, and post-training), with an explanation of the training intervention and the instruments utilized. Emphasis is placed on justifying each methodological choice with reference to established research practices. This focus is timely, as ESP teacher education has been relatively neglected and ESP practitioners have had limited professional development opportunities. Moreover, the rapid shift to online teaching during the COVID-19 pandemic has made effective teacher training for online environments more critical than ever. It is widely recognized that ongoing professional development is essential for instructors adopting new roles and competencies in virtual classrooms. Within this context, an action research approach with a mixed-methods design was chosen to both implement a targeted development program and study its impact in a rigorous, reflective manner.

2.2. The Research Methodology

This study employed an action research (AR) methodology, structured as an intervention to improve practice in a real educational setting. Action research is a participatory and reflective form of inquiry where practitioners investigate their own context with the goal of improving it. It is particularly applicable in education because it allows for iterative cycles

of action and reflection, bridging research and practice. Kemmis and McTaggart (1988) define AR as a cyclical process of planning, acting, observing, and reflecting, aimed at progressive problem solving in the field. Such a cycle enables continuous feedback and adaptation, engaging the researcher and participants as co-learners addressing real-world classroom challenges. Philosophically, AR is underpinned by constructivist and critical paradigms, valuing the co-construction of knowledge and transformative reflection. In other words, knowledge is derived through practical action and collaboration (O'Brien, 2001). AR empowers teachers to systematically examine and improve their own instructional practices, functioning simultaneously as a research method and a form of professional development. Indeed, in the field of language teaching, AR has become increasingly popular as a means of continuous teacher development, with documented positive impacts on teachers' confidence and instructional skills. Mertler (2020) similarly highlights that AR provides educators with a structured yet flexible process for reflective practice and ongoing improvement.

For this study, an interventionist action research design was adopted to address the specific problem of ESP teachers' readiness for online teaching. The urgency of improving online pedagogical skills heightened by the pandemic's revelation of preparedness gaps – made AR an appropriate choice. Traditional one-off research designs often fail to capture the iterative nature of pedagogical transformation needed in this context. By contrast, AR allowed for a dynamic, responsive process: the researcher implemented a training program, observed its effects, and refined understanding through reflection. This approach aligns with the practical goal of effecting positive changes in teaching practice through collaboration and inquiry. It also meant that the research itself doubled as a professional learning opportunity for the participants, a dual benefit supported by prior studies (Edwards & Burns, 2016). Below section is an overview that includes some definitions, the models, and steps that were implemented in this Action Research study.

Action research in this study followed a well-established model of iterative cycles. In particular, the design drew on the classic AR cycle described by Susman (1983) (as cited in O'Brien, 1998) comprising five phases: diagnosing, action planning, taking action, evaluating, and specifying learning. Figure 2.1 (below) illustrates this cyclic process. In practice, these phases were manifested in three broad stages of the project, with some phases combined for efficiency:

- **Diagnosing:** Identifying the problem and needs. A preliminary needs analysis questionnaire and pre-intervention classroom observations were conducted to diagnose the specific challenges ESP teachers faced in online instruction. This established a baseline of participants' digital competencies, pedagogical gaps, and professional development expectations.
- **Action Planning (and Preparation):** Developing a solution strategy. Based on the diagnosed needs, a tailored training program was carefully designed. The planning drew upon relevant literature and frameworks to target the identified skill gaps. This included selecting appropriate digital tools (e.g. Zoom and its breakout rooms) and pedagogical methods (e.g. task-based online activities) to be featured in the training. Clear training objectives, materials, and a syllabus were formulated during this phase (detailed in Section 3.5.1).
- **Taking Action (Implementation):** Executing the intervention. The professional development training was delivered to the participants over a specified period (details in Section 3.5.2). Teachers participated in interactive workshop sessions, applying new strategies and tools in a guided environment.
- **Evaluating (Observation & Reflection):** Assessing the outcomes of the action. Following the training, the researcher observed the participants' teaching in the online

classroom again (post-training observation) and administered a feedback questionnaire. These measures were used to evaluate improvements in teaching practices and to gather the teachers' reflections on the training's effectiveness.

- **Specifying Learning:** Drawing conclusions and recommendations. The final phase involved analyzing the collected data to determine what was learned from the intervention – i.e., in what areas teachers improved, which challenges persisted, and what adjustments might be needed moving forward. The insights from this reflection phase informed recommendations for future practice and research, thereby closing the cycle of AR with lessons that can be carried into the next iteration or shared with the broader community of practice.

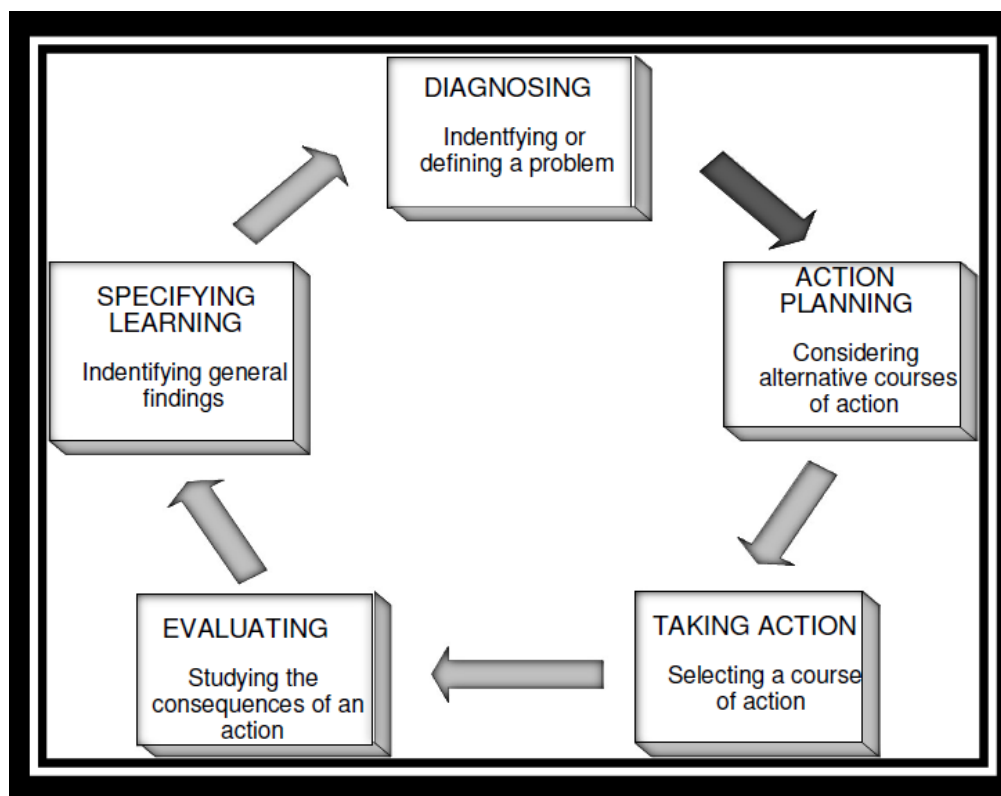


Diagram 2. 1. Action Research Model

(Susman, 1983 quoted in O'Brein, 1998)

In the following table, one may clearly see the five essential steps this study and similar studies may go through: that was adapted by Mebitil (2015) in one of her studies

Steps	The Main Activities
Diagnosing	- Analyzing the situation and ESP teaching challenges in online settings; - Stating the problem related to pedagogical readiness and digital literacy; - Establishing a general framework of the intervention; - Collecting initial input through needs analysis questionnaires and pre-observations.
Action Planning	- Identifying suitable pedagogical solutions through literature and contextual analysis; - Planning training modules addressing specific digital and pedagogical gaps; - Determining appropriate tools (Zoom, breakout rooms, task-based methods); - Establishing timelines and expected outcomes.
Taking Action	Delivering the training sessions across six days (2 hours/day); - Engaging teachers in simulations, digital tasks, and online lesson planning;
Evaluating	- Conducting post-training observations and feedback questionnaire; - Comparing pre- and post-intervention data for effectiveness assessment.
Specifying Learning	- Reflecting on teachers' improvements and persistent challenges; - Outlining limitations and practical implications; - Making recommendations for future research or policy adaptation.

Table 2. 1.: Selected Steps and Activities of Action Research

This cyclical design ensured the study remained dynamic and responsive, allowing continuous monitoring and adaptation in line with reflective practice. The action research methodology's emphasis on real-time feedback loops was essential for capturing growth in teachers' competencies and for refining the professional development approach as needed. Notably, the dual role of the researcher as facilitator and observer offered a rich, insider perspective into the process, while still maintaining systematic data collection for credibility. In constructing the training intervention, additional models and best-practice frameworks were consulted to enhance its effectiveness. The design of the training drew upon principles from the ASU Online Course Design Toolkit (Arizona State University, 2024), which outlines research-based best practices for effective online course delivery. Key components emphasized included instructional alignment (ensuring learning outcomes, activities, and assessments are coherently matched), learner engagement (using interactive strategies to keep teachers actively involved), and accessibility (making content usable for all participants, mirroring inclusive online teaching strategies). For instance, the toolkit's guidelines on course alignment helped inform how the training sessions were structured and sequenced.

Additionally, the well-known TPACK framework (Technological Pedagogical Content Knowledge) was used as a guiding paradigm for content, to ensure the training integrated technology with pedagogy and subject matter appropriately. TPACK emphasizes that effective online teaching requires blending knowledge of technology, sound pedagogical techniques, and content expertise (Mishra & Koehler, 2006). By designing the training around TPACK, the study aimed to improve teachers' ability to use digital tools (technological knowledge) in pedagogically meaningful ways (pedagogical knowledge) for their specific ESP

course content (content knowledge). This theoretically grounded approach strengthened the intervention's relevance and potential impact.

The chosen methodology incorporated a mixed-methods approach within the AR framework. A combination of quantitative and qualitative methods was used to gain a comprehensive understanding of the outcomes. The rationale for mixing methods was that neither quantitative nor qualitative data alone would sufficiently capture the multifaceted changes involved in teacher development. By collecting numeric data (e.g., observation scores, survey ratings) alongside qualitative insights (e.g., open-ended feedback, field notes), the study was able to triangulate findings and enhance the validity of conclusions. This approach is endorsed by Creswell and Plano Clark (2011) as particularly effective in educational intervention research, where understanding both measurable outcomes and contextual experiences is important.

In line with this, Johnson and Onwuegbuzie (2004) have noted that the inherent pluralism of mixed-methods research can yield more robust, comprehensive results than single-method designs, by capitalizing on the strengths of both approaches. In summary, the methodology for this research can be described as action research with a mixed-methods, quasi-experimental design. It is action-oriented (in that it implements an educational intervention aimed at improvement) and research-oriented (in that it systematically investigates the process and outcomes using multiple forms of data). This design was uniquely suited to address the research objectives: it allowed for practical change (upskilling teachers for online pedagogy) while simultaneously generating empirical evidence on the effectiveness of that change effort.

2.3. The Design of the Study

With the methodology established, the study's overall design can be conceptualized as a framework linking the preparatory groundwork, the intervention, and the evaluation in a

logical flow. A conceptual diagram (Diagram 2.2) was developed to visualize how the components of the research interrelate. The diagram illustrates the foundational inputs – the literature on ESP teaching, teacher training principles, and online pedagogy best practices – which informed the development of the training program. It then maps out the sequence from program design to participant selection, and through the three phases of implementation (pre-training, training, post-training). This visual representation helped ensure coherence in the study's structure. All elements of the design were aligned with the research questions, ensuring that each phase produced data to address those questions.

In essence, the study design begins with identifying the training content and objectives (grounded in theory and needs analysis), followed by selecting the trainees (participants) and preparing the trainers/researcher. It then proceeds through the intervention phases, and culminates in data analysis and reflection. The design's logical flow facilitated a clear path from recognizing the problem (ESP teachers' online teaching needs) to implementing a solution (the PD training) and finally to assessing outcomes (changes in teaching practice and teacher perceptions).

Throughout, the integrity of the design was maintained by using consistent measures at pre- and post-stages and by integrating findings at the interpretation stage. The use of a mixed-methods, action research design ensured that qualitative insights could explain quantitative results, and vice versa, thus providing a rich, triangulated understanding of the impact of the intervention. This deliberate design choice enhanced the study's internal validity and practical relevance.

The foundational framework of this research design embodies three interrelated layers:

Layer 1: Theoretical Grounding and Literature Base

The entire research design was anchored in well-established theoretical frameworks and empirical literature. According to Creswell and Creswell (2018), a rigorous research design

must explicitly connect to theoretical foundations and prior research. In this study, the theoretical base comprised: (1) needs analysis theory in ESP (Dudley-Evans & St. John, 1998; Hutchinson & Waters, 1987), which established that professional development must be responsive to identified gaps rather than generic; (2) action research theory (Kemmis & McTaggart, 1988), which provided the iterative, reflective cycle of planning-acting-observing-reflecting; (3) the TPACK framework (Mishra & Koehler, 2006), which specified that effective technology integration requires simultaneous development of technological, pedagogical, and content knowledge; and (4) research on teacher professional development effectiveness (Joyce & Showers, 2002), which informed the design of the training delivery and follow-up mechanisms. This theoretical foundation ensured that the research design was not arbitrary but rather grounded in how learning and change are understood in education.

Layer 2: Intervention Design and Implementation

The intervention itself—the training program—was deliberately designed to operationalize the theoretical frameworks. Rather than a one-size-fits-all workshop, the training was tailored specifically to the identified needs of the participating teachers, informed by the needs analysis questionnaire and pre-training observations. The training program's structure reflected best practices in adult professional development: it combined input and practice, modeled the pedagogical strategies it taught, incorporated collaborative learning, and provided opportunities for immediate application and reflection. Importantly, the intervention was implemented not in isolation but as an integral component of the action research cycle, with continuous feedback mechanisms built in (e.g., teacher feedback during sessions, informal observations by the facilitator) that allowed for real-time adjustments.

Layer 3: Systematic Data Collection and Mixed-Methods Analysis

The design incorporated systematic data collection at multiple points—pre-training, during training, and post-training—using instruments specifically designed to measure the constructs

identified in the research questions. The use of multiple instruments (needs analysis questionnaire, observation checklists, feedback questionnaire) and multiple data types (quantitative scores, qualitative narratives, observation field notes) created a triangulated design. According to Denzin and Lincoln (2017), triangulation strengthens validity by allowing findings from one method to corroborate or contextualize findings from another. For example, improvements in observation scores could be cross-verified with teachers' self-reported confidence gains and qualitative descriptions of what changed in their practice.

Integration with Action Research Phases

The overall design explicitly integrated the five-phase action research cycle described previously (Diagnosing, Action Planning, Taking Action, Evaluating, Specifying Learning) into three operational phases aligned with the project timeline:

Pre-Training Phase (Diagnosing & Action Planning): This phase combined the "diagnosing" step—identifying the problem and establishing baseline—with "action planning"—designing the intervention in response to identified needs. Teachers completed the Needs Analysis Questionnaire and were observed in their current practice (baseline). Simultaneously, the research team analyzed these findings and used them to refine the training program content and pedagogy, ensuring alignment with actual teacher needs rather than assumed needs.

Training Phase (Taking Action): This phase executed the planned intervention. Teachers participated in six intensive workshop sessions over three consecutive days, implementing the pedagogical strategies in collaborative learning activities, receiving real-time feedback from the facilitator and peers, and beginning to internalize new practices through experiential learning.

Post-Training Phase (Evaluating & Specifying Learning): This phase involved observing teachers' practices again in their own classrooms (post-training), administering a feedback

questionnaire to capture their reflections and perceived gains, and conducting detailed analysis of changes. Importantly, this phase was also reflective—the researcher synthesized findings to understand what learning occurred, what challenges persisted, and what recommendations could guide future iterations or scaling of the intervention.

The overall design of this study exemplifies a carefully planned, theoretically grounded, and methodologically rigorous approach to studying teacher professional development in a real-world context. By employing action research with a mixed-methods design, the study was able to (1) implement an intervention responsive to identified needs (action research strength), (2) systematically measure outcomes using both quantitative and qualitative data (mixed-methods strength), and (3) simultaneously support teacher development and contribute to the knowledge base on online ESP teacher training (bridging practice and research). The design's emphasis on triangulation, alignment, and integration of methods and phases created a comprehensive picture of whether and how the training enhanced teachers' online pedagogy competencies, while remaining grounded in the practical reality and constraints of the Algerian higher education context.

The logical flow from needs diagnosis to intervention design to systematic evaluation, combined with the use of consistent pre/post measures and multiple data sources, positioned the study to generate credible, actionable findings that would inform both the participating teachers' practice and the broader ESP teacher development field.

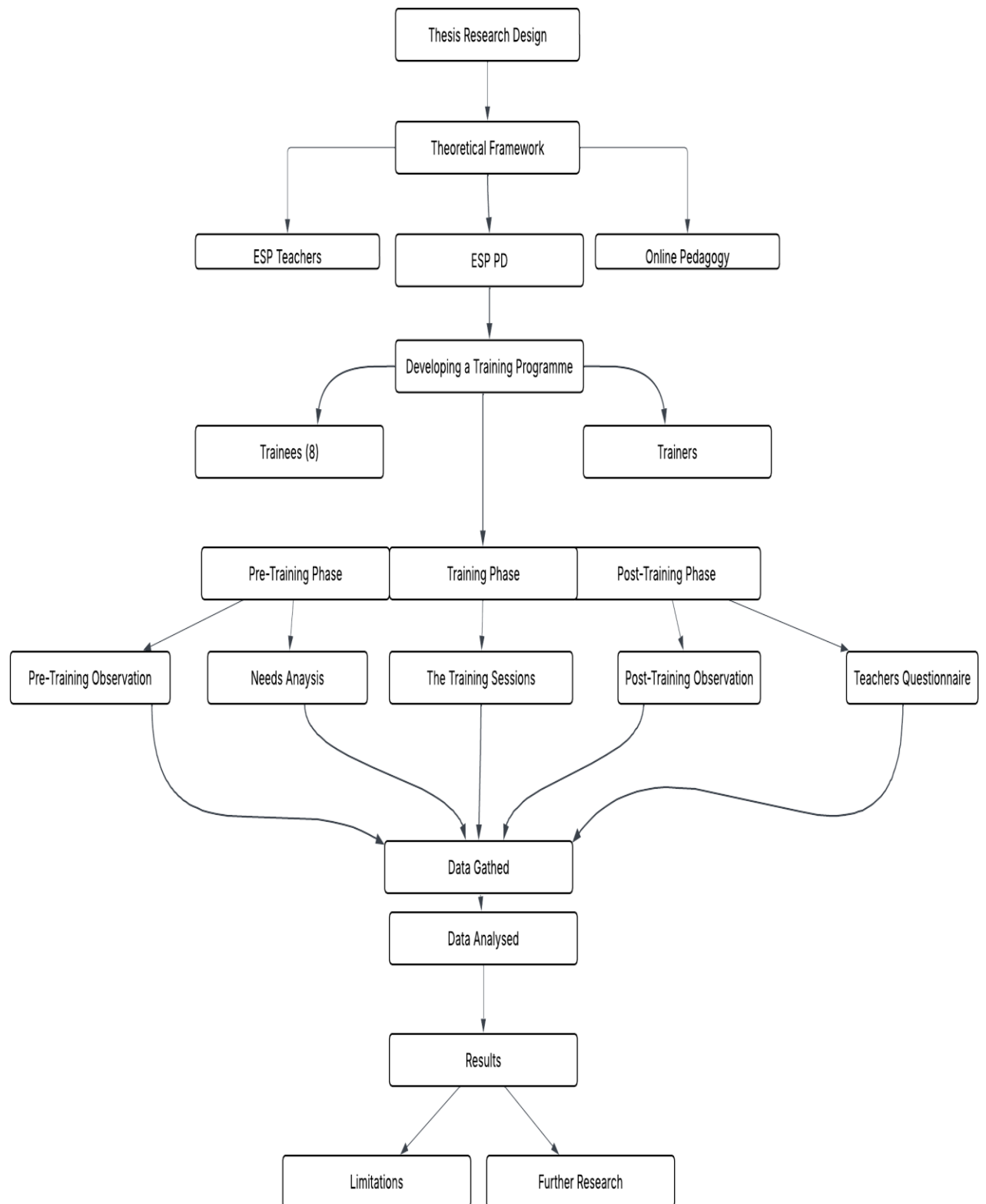


Diagram 2. 2. The Overall Design of the Study

2.4. Sampling

Choosing the right participants for the study was of vital importance, as the sample needed to align with the research objectives and context. In educational research, sampling refers to selecting a subset of individuals from a larger population so that conclusions about the population can be drawn from the subset. A well-designed sampling strategy increases the reliability and validity of findings, particularly in studies of teacher development where contexts are diverse. According to Dörnyei (2007), a *sample* is “the group of participants whom the researcher actually examines in an empirical investigation,” whereas the population is “the group of people whom the study is about. In this study, the target population was ESP teachers involved in online teaching within the higher education system (specifically, Algerian universities), and the sample was the specific group of ESP teachers who participated in the action research project.

2.4.1. Introduction to Sampling in Educational Research

After reviewing the literature on research sampling, the study adopted a two-stage sampling technique that combined elements of purposive sampling and random sampling. Sampling methods in educational research can be broadly categorized as either probability sampling or non-probability sampling. In probability sampling, participants are selected through a random process, giving each member of the population a known chance of inclusion. This category includes techniques such as simple random sampling, stratified sampling, cluster sampling, and systematic sampling. For example, simple random sampling involves selecting participants entirely by chance (the researcher used an online website for selecting the participants), so that every individual has an equal probability of being chosen. This method is lauded for its impartiality and is often recommended when seeking a representative sample of a large population (Creswell, 2008). Other probability methods like stratified sampling

(dividing the population into subgroups and randomly sampling within each) and cluster sampling (randomly selecting entire groups or clusters, such as classes or schools) can improve representativeness when certain subgroup characteristics or clustering are relevant.

In contrast, non-probability sampling involves selection based on factors other than pure chance, and not every individual has a known or equal chance to participate. This category includes approaches like purposive sampling, snowball sampling, quota sampling, and convenience sampling. Purposive sampling (also known as judgment sampling) is especially common in educational research; participants are hand-picked because they meet specific criteria relevant to the study's purpose. For instance, a researcher might intentionally select teachers who have experience with online instruction if the study is about online teaching methods (Teddlie & Yu, 2007). Snowball sampling involves existing participants recruiting future participants (useful for hard-to-reach populations), quota sampling ensures certain characteristics are represented in fixed proportions, and *convenience sampling* simply involves selecting those who are readily available and willing.

For the current research, a purposive sampling strategy was first used to identify a pool of potential participants. Specifically, the researcher targeted ESP teachers in Algerian universities who fit predefined inclusion criteria (see Section 3.4.3 below). This initial step yielded a group of candidates who were well-aligned with the study's focus: these were practicing ESP instructors with exposure to online teaching, thus likely to benefit from – and contribute meaningfully to – a professional development intervention on online pedagogy. A total of fifteen (15) ESP teachers were invited and expressed interest in taking part, all of whom met the key criteria (e.g., teaching ESP at tertiary level and involved in e-learning). This use of purposive sampling ensured that the sample would be information-rich and relevant, a crucial consideration given the intensive nature of the action research project.

However, involving all 15 interested teachers in the intervention was not feasible due to the intensive workshop format and the depth of qualitative analysis required. Therefore, in the second stage, simple random sampling was applied to this pool to select the final group of participants. From the fifteen eligible volunteers, eight (8) teachers were randomly chosen to form the study's sample, and the remaining seven were placed on a waiting list (to be included if any of the selected participants had to withdraw). The random selection was conducted in an impartial manner (by assigning numbers to each candidate and using a random number generator) to ensure fairness. By introducing a random element, the researcher aimed to reduce potential selection bias that could occur if only personal judgment were used to pick participants from the qualified pool.

This dual sampling approach (purposive + random) allowed the study to balance relevance and representativeness. Purposive sampling ensured that participants had the necessary background to engage meaningfully with the training intervention (e.g., experience in ESP and basic familiarity with online teaching), while random sampling added an element of objectivity in the final selection. In other words, the first stage guaranteed that all candidates were suitable and likely to benefit, and the second stage treated those suitable candidates equitably, giving each an equal chance to be included. Adopting this combined strategy aligns with best practices noted in mixed-methods action research literature. Similar two-stage sampling designs have been recommended by researchers to attain a targeted yet unbiased sample (Cierpiałowska 2023, Mebitil, 2015). Moreover, by selecting participants who are most relevant to the research question and then randomly choosing among them, the study can enhance the credibility of its results through what Dörnyei (2007) calls triangulation of data sources – in this case, ensuring that a diverse cross-section of the relevant population (ESP online instructors) is represented.

The chosen sample size of eight was considered optimal for an in-depth action research project. In AR, working with a relatively small group is advantageous for fostering collaboration and allowing deep qualitative insights, and it conforms to norms in practitioner research where manageability and intensive engagement are prioritized over notes that small, focused samples in action research can facilitate greater participation and richer data, as was intended here.

Stage	Description	Number of Teachers
1	Expressed interest and signed consent	15
2	Randomly selected for training	8
3	Placed on waiting list	7

Table 2. 2: Sampling Structure

2.4.2. Sample Description

The final sample consisted of eight ESP teachers drawn from the target population as described. All eight participants were teaching at the tertiary (university) level in Algeria, across a range of academic disciplines where ESP instruction is common. Specifically, the group included ESP instructors specializing in fields such as Engineering, Business, and Biology, among others. This disciplinary variety was advantageous, as it meant the training program would be tested by teachers dealing with diverse content and student needs, potentially enhancing the generalizability of the findings within the ESP context. All selected teachers held at least a Master's degree (or higher) in English or a related field, which is typical for ESP instructors at the university level under the Algerian system. Their professional experience ranged from those relatively new to ESP teaching to those with many years in the field, providing a balanced mix of perspectives.

Crucially, all participants were actively engaged in online teaching at the time of the study (due either to fully online courses or blended learning situations necessitated by university policy or the COVID-19 pandemic). This ensured that they had first-hand experience with the challenges of virtual instruction and could immediately apply the training content to their practice. In terms of digital experience, the teachers had varying levels of familiarity with common online educational tools (e.g., video conferencing platforms like Zoom or Google Meet, Learning Management Systems, etc.), but all had at least a basic working knowledge of these technologies. Some participants had been using such tools for a few semesters and were looking to refine their strategies, while others had only rudimentary exposure and were eager to build confidence. A profile summary of the participants (see Table 3.3 Below) provides further details, including each teacher's institution, ESP specialty, years of teaching experience, years of *online teaching* experience, and self-reported familiarity with digital tools. This profile information underscores that although the sample size was small, it was *purposefully diverse* in relevant characteristics, which enriched the action research process by incorporating multiple viewpoints.

Overall, the sample can be described as experienced, motivated, and context-appropriate. The participants were experienced in the sense that all were qualified educators familiar with ESP contexts; they were motivated, as evidenced by their voluntary enrollment and willingness to invest time in the professional development project; and they were context-appropriate because their background and current roles aligned directly with the focus of improving online ESP teaching. Working intimately with this group over the course of the study provided deep insights into how targeted training can influence teaching practice. It also allowed for the development of a supportive community of practice among the participants, who could share experiences and learn collaboratively – a noted benefit when teachers undergo professional development as a cohort (Vescio, Ross, & Adams, 2008).

Participant code	Gender	Institution	Field of ESP	Online Teaching Experience	Familiarity with Online Tools
P1	Male	Higher School of Management	Business English	2 years	Intermediate
P2	Female	National Polytechnic	Engineering English	1 year	Basic
P3	Female	Faculty of Science	Biology	3 years	Advanced
P4	Male	Faculty of Economics	Business English	2 years	Intermediate
P5	Female	Institute of Telecommunication	Technical English	1.5 years	Intermediate
P6	Male	Faculty of Sciences & Technologies	Computer sciences	2 years	Basic
P7	Female	Faculty of Engineering	Engineering and applied sciences English	1 year	Basic

P8	Female	National Business School	Business English	2.5 years	Advanced
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Table 2. 3: Profile of the Sample**2.4.3. Selection Criteria**

The participants were selected based on several inclusion criteria that were established to ensure the sample's relevance and homogeneity in key aspects. These criteria were determined prior to recruitment, guided by the study's objectives and the practical considerations of running the training program:

- **Current ESP Teaching at University Level:** Participants had to be actively teaching ESP courses at a university or higher education institute. This criterion ensured that the training content would be directly applicable to their professional context. Moreover, it required that each teacher held at least a Master's degree (as is standard for university ESP instructors in Algeria), ensuring a baseline of content expertise and pedagogical training.
- **Basic Familiarity with Online Teaching Tools:** Teachers needed to have some prior exposure to online teaching platforms or tools (such as Zoom, Google Meet, Moodle, etc.). The rationale was that completely novice users of technology might require more fundamental training beyond the scope of this study. A basic familiarity meant the participants could navigate an online class environment, even if not expertly, allowing the training to focus on pedagogy and integration of tools rather than on rudimentary technical skills.

- **Willingness and Availability for Full Participation:** It was critical that participants were willing to engage in all phases of the research – from initial needs assessment through the training sessions, and into the post-training follow-up (observations and feedback).

Teachers who volunteered signed an informed consent form confirming their commitment to attend the scheduled training workshops (spread over the designated period) and to allow classroom observations before and after the training. Given the time and effort required (the training, in particular, spanned multiple days), only those who could allocate the necessary time were included. Enthusiasm for professional development was considered a positive indicator, as the training's success partly depended on active participation and reflection by the teachers.

In addition to these primary criteria, an effort was made to balance the sample in terms of certain attributes. For example, the final selection was narrowed in such a way as to include teachers from different institutions and disciplines, and with a mix of teaching experience levels. This balancing was done to avoid any one institutional culture or discipline dominating the training discussions, and to observe whether the intervention had consistent effects across varied sub-contexts of ESP. The idea was to capture a range of perspectives – e.g., an engineering ESP teacher might face different online teaching hurdles than a business ESP teacher, and having both in the training could spur richer exchange and also test the training's adaptability.

All fifteen teachers who initially volunteered met the core criteria, so the random selection of eight naturally produced a group that satisfied these requirements. Nonetheless, the researcher double-checked that the final eight indeed reflected the intended diversity and fit. As it turned out, the random draw yielded five (5) female and three (3) male teachers, from four different universities, covering three broad ESP domains (scientific/technical English, business English, and medical English). Such diversity was considered a bonus, as it aligns

with recommendations to include varied participants in teacher development research to improve the robustness of conclusions (Cohen et al., 2018).

Before proceeding to the next stage of the project, all selected participants were formally enrolled in the study. Ethical procedures were observed: each teacher received a detailed explanation of the study's purpose, what their participation would entail, and the measures taken to protect their privacy and data. They each signed the consent form (see Appendix 5) indicating their informed consent to participate in the training, observed teaching, and complete questionnaires. Confidentiality of their responses was assured, and pseudonyms or codes were used in data analysis and reporting to protect their identities. Participants were also informed that they could withdraw from the study at any time without penalty. These steps were in line with ethical guidelines for educational research and ensured that the sampling process was transparent and respectful of participants' rights.

In summary, the sampling technique was tailored to the study's dual needs for specificity (focusing on ESP online teachers) and credibility (introducing randomness to reduce bias). The resulting sample of eight teachers was well-suited for the action research project, providing a solid foundation for implementing the research activities described in the next section. It is worth noting that while the sample is not large in number, its strategic composition and the intensive nature of data collection with each participant favor depth of insight over breadth. This approach is consistent with action research goals and is expected to yield findings that, while context-bound, offer rich implications for similar contexts elsewhere.

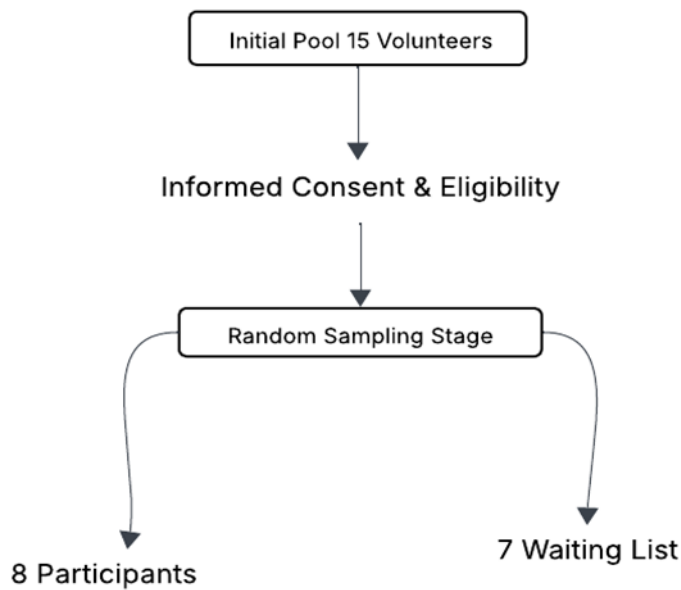


Diagram 2. 3: Sampling Framework in the Action Research Cycle

2.5. The Research Project

This section describes the execution of the research project in three main phases – Pre-Training, Training, and Post-Training – corresponding to the action research cycle stages discussed earlier. Each phase involved specific activities, instruments, and procedures, all designed to collectively address the research questions. The intervention at the heart of the project was a structured teacher training program aimed at enhancing the participants’ online pedagogy skills for ESP. Below, we detail each phase, including the development of the training content, its implementation, and the evaluation measures. Throughout the project, care was taken to ground decisions in established best practices for teacher professional development, as reflected in the literature.

2.5.1. The Pre-Training Phase

The pre-training phase represented the diagnostic foundation of the action research cycle. It aimed to identify the participants' digital competencies, pedagogical gaps, and expectations in relation to online English for Specific Purposes (ESP) instruction. This phase aligned with the 'planning' and 'observing' stages described by Kemmis and McTaggart (1988), and as applied by Mebitil (2015), who emphasized the importance of establishing a clear baseline for professional development interventions.

The pre-training phase laid the groundwork for a targeted and effective intervention. In this phase, the emphasis was on diagnosis and preparation. It comprised two critical components: (a) conducting a Needs Analysis to diagnose participants' specific professional development needs and baseline competencies, and (b) designing the training program (training overview, objectives, materials, and syllabus) in response to those identified needs.

2.5.1.1. Training Needs Analysis and Overview

Questionnaires are widely used tools in educational research for their ability to efficiently collect large volumes of both qualitative and quantitative data (Cohen, Manion, & Morrison, 2018). At the outset, a Needs Analysis Questionnaire was administered to all participating teachers. This was a structured survey instrument (see Appendix 1) containing both Likert-scale items and open-ended questions. The questionnaire asked teachers about their current practices and challenges in online ESP teaching, their confidence with various digital tools and teaching strategies, and the areas in which they felt further training would be beneficial. For example, teachers rated statements like "I am confident in managing group work activities in online classes" on a scale, and described in writing what difficulties they face in engaging ESP students remotely. The rationale for starting with a needs assessment was to ensure that the subsequent training would be participant-centered and data-driven. In ESP

(whether for students or teachers), needs analysis is a cornerstone for designing relevant instruction. By systematically gathering this information, the researcher could pinpoint common training needs such as mastering specific educational technologies (e.g., using an LMS effectively), pedagogical strategies (e.g., interactive techniques for virtual environments), or content adaptation (e.g., creating ESP materials for online delivery).

Concurrently, an initial Classroom Observation (pre-training observation) was conducted for each teacher. The researcher either joined one of the teacher's live online class sessions or viewed a recording (with permission), using a standardized observation checklist (see Appendix 7) to document teaching behaviors and methods. The checklist was developed based on literature about effective online teaching and included categories like lesson structuring, use of multimedia, interaction patterns, feedback provided to students, and technology management. This observation served two purposes: it provided another lens on the teachers' starting point (complementing the self-reported data from the questionnaire), and it sensitized the researcher to contextual factors in each teacher's online classroom (such as typical class size, students' responsiveness, etc.). Observing actual teaching in action allowed for a more nuanced needs analysis – for example, a teacher might not mention certain issues in the questionnaire but an observation could reveal, say, low student engagement or suboptimal use of the platform's features. These findings were noted and later fed into the training design. The results of the needs analysis were summarized and analyzed. Quantitatively, descriptive statistics (means, frequencies) were computed for the Likert items to gauge areas of collective strength and weakness (detailed in Section 3.7.1). Qualitatively, the open-ended responses were coded for recurring themes (e.g., “difficulty motivating students online” or “lack of knowledge of advanced Zoom features”). Triangulating these with the observation notes gave a comprehensive picture of what the teachers needed and wanted from the training.

Key findings indicated, for instance, that most participants were comfortable with basic tools (like sharing slides or communicating via chat) but struggled with designing interactive activities online and assessing learners virtually. Many expressed a desire for more ideas to increase student engagement in virtual classrooms, and some noted technical constraints (like low bandwidth issues) that affect their teaching strategies. These insights directly informed the planning of the training content.

With a clear understanding of needs, the researcher formulated a Training Overview. The professional development program was envisioned as a six-day workshop series, delivered over two weeks (three sessions per week), with each session lasting approximately two hours. This schedule was chosen to provide a sufficient total duration (about 12 hours of training in total) while spacing sessions out to allow participants some reflection and practice in between. Notably, research on teacher PD suggests that an adequate “duration” and opportunities for active learning are core features of effective programs. The training was thus designed not as a one-off seminar but as a short course to promote sustained engagement. The overview of the training, shared with participants in advance, highlighted that the program would be interactive, practice-oriented, and tailored to ESP online teaching. It also outlined the main themes to be covered (detailed under the syllabus section below).

2.5.1.2. Training Aims and Objectives

Clear aims and learning objectives were set for the training program, aligning with the diagnosed needs. The overall aim of the training was: To enhance ESP teachers’ pedagogical skills and confidence in delivering online instruction. From this broad aim, several specific objectives were derived. These objectives were stated in measurable terms so that both the participants and the researcher could evaluate whether they were achieved by the end of the program. The key training objectives included:

Objective 1: Improve teachers' proficiency in using online teaching tools relevant to ESP. This meant by the end of training, participants should be able to effectively use features of web-conferencing platforms (e.g., screen sharing, breakout rooms, polls) and other digital resources to support language learning.

Objective 2: Introduce and practice interactive online teaching strategies. Teachers would learn methods to increase student participation and engagement in virtual classes, such as collaborative tasks, online discussions, gamified learning activities, etc., and integrate these into their ESP lessons.

Objective 3: Develop teachers' skills in designing ESP materials for online delivery. This involved adapting or creating instructional materials (like reading texts, vocabulary exercises, simulations) that are suitable for online use, taking advantage of multimedia and hyperlinks, while considering principles of instructional design.

Objective 4: Enhance teachers' ability to assess learners and provide feedback in an online environment. The training would cover techniques for online assessment (formative and summative), using tools like online quizzes or assignments, and strategies for giving timely, constructive feedback electronically.

Objective 5: Foster reflective practice and continuous improvement. Encourage teachers to reflect on their online teaching experiences, identify what works or doesn't, and utilize action research cycles in their own practice for ongoing development beyond the formal training.

These objectives were informed by the literature on effective teacher PD which emphasizes content focus (here, focusing on ESP and online pedagogy content), active learning, coherence with teachers' context, sufficient duration, and collective participation. By explicitly addressing these areas in the objectives, the training was designed to meet recognized standards of impactful professional development (Desimone, 2009). For example, focusing on actual tools and strategies the teachers will use (content-specific PD) and having them work

together and reflect (collective participation, active learning) are strategies known to improve PD outcomes.

2.5.1.3. Training Materials and Resources

The pre-training phase also involved gathering and creating the materials and resources needed for the workshop sessions. Given that the training itself was delivered online (in the same medium that the teachers would be using with their students), careful thought went into selecting user-friendly and effective tools. The primary platform for conducting the training was Zoom, owing to its familiarity and robust feature set (this was also the platform many participants were already using in their teaching). Zoom's features like breakout rooms, chat, polling, and screen sharing were leveraged extensively during the training to model their pedagogical use. For instance, breakout rooms were used to simulate small group activities, so teachers could experience from a student perspective how group work feels online and from a teacher perspective how to set up and monitor such rooms.

A variety of digital tools and websites relevant to ESP were curated. These included: interactive presentation tools (e.g., Mentimeter or Nearpod) to show how to gather student input in real time; learning management components (e.g., how to structure a module on Moodle or Google Classroom for ESP coursework); subject-specific resources like online simulators or corpora for ESP topics; and mobile applications that students could use for language practice. Each tool was chosen to address a specific need identified in the needs analysis. For example, if teachers expressed difficulty in getting students to practice technical vocabulary, a demo of a vocabulary quiz app or a corpus tool was included. Beyond digital tools, traditional training materials were prepared in digital format: presentation slides for each session, handouts or checklists (as PDF files) summarizing key techniques, and example lesson plans. All materials were made accessible through a shared online folder, functioning as a resource bank that teachers could download and refer to later. The materials drew on

established frameworks and examples from TESOL and ESP literature – for instance, sample lesson excerpts from TESOL Quarterly articles that illustrate good practice were included for discussion.

Additionally, the ASU Online Design Toolkit (2024) recommendations were distilled into a concise guide that was shared, so participants could see an external benchmark for quality online course design. Such design was intentional: educators often learn best by doing, especially in technology integration contexts (Lawless & Pellegrino, 2007). The training materials therefore doubled as exemplars of online teaching methods. Teachers could later emulate or adapt these examples in their own classes. Finally, in terms of human resources, it's worth noting that the researcher acted as the primary facilitator of the training. There was coordination with the participants' institutions to schedule the training at convenient times, and one experienced ESP colleague was invited as a guest speaker for some session to share his insights on managing online project work (this enriched the material with a peer perspective). All these preparations ensured that when the training phase began, everything was in place to provide a smooth and professionally rewarding experience for the participants.

2.5.1.4. Training Syllabus Design

Based on the needs analysis and the objectives outlined, a detailed training syllabus was developed. The syllabus mapped out the content and activities for each of the six training sessions, ensuring a logical progression and cohesive structure in (Appendix 8) presents an overview of the training schedule and topics. Here, a narrative summary is provided:

- **Session 1:** Introduction to Online ESP Pedagogy , this opening session set the stage by addressing the current landscape of online ESP teaching. It covered the challenges identified (e.g., student engagement, adapting materials) and introduced the concept of using an action-reflection cycle in one's own practice. Teachers were presented with the TPACK framework explicitly, to frame subsequent learning in terms of tech,

pedagogy, and content integration. Interactive activity: Teachers shared one success and one struggle from their online teaching experience (either via a short oral presentation or in the chat), fostering a sense of community and common purpose from the start.

- **Session 2:** Online Tools and Platforms for ESP , this session delved into the technological dimension. It was essentially a hands-on exploration of various tools. The session started with a live demonstration of Zoom's advanced features (polls, whiteboard, breakout management) by using them in real-time with participants. Then, other tools were introduced: for instance, an online quiz platform (Kahoot or Quizizz) for ESP vocabulary, a collaborative writing tool (Google Docs) to show how students can jointly write or brainstorm, and an LMS overview showing how to organize content/modules. Participants practiced as students on these tools, then switched to discuss how they might implement them as teachers. The session emphasized aligning tool use with pedagogical goals (from the ASU toolkit: not using technology for its own sake, but to support learning outcomes).
- **Session 3:** Interactive Techniques for Online Learning , focused on pedagogy, this session provided strategies to engage learners. Content included techniques like the flipped classroom (having students preview materials via short videos then discuss online), using breakout rooms effectively for role plays or peer teaching, incorporating games or competitions, and facilitating online discussions (both synchronous and asynchronous). Teachers were given scenarios and asked to design a short interactive activity for their ESP context in groups. For example, one group designed a role-play for a business English negotiation via breakout rooms, another crafted a science quiz competition. The group work was then shared, giving participants a portfolio of ideas. This session also touched on maintaining student motivation and attention in an online

setting – drawing on concepts of presence and social interaction from the Community of Inquiry model (Garrison et al., 2000) and practical tips like using students' names, injecting humor, etc.

- **Session 4: Developing Online ESP Materials** , here, the focus shifted to content and materials development. Teachers examined how an existing ESP lesson (e.g., a reading comprehension from an ESP textbook) could be transformed for online delivery. Principles of instructional design were reviewed: chunking content, using multimedia elements (images, audio/video clips), ensuring accessibility (e.g., providing transcripts for videos). Participants were introduced to simple content creation tools (e.g., Canva for infographics, PowerPoint for creating video lectures). In an exercise, each teacher selected a topic from their syllabus and sketched an outline for an online lesson, detailing which materials they would use or create. The ASU toolkit's concept of instructional alignment was reinforced – making sure that the material, the activity, and the objective align clearly. For example, if the objective is improving speaking skills in meetings, the material might be an annotated video of a meeting, and the activity could be a live role-play or a simulation on Zoom.
- **Session 5: Online Assessment and Feedback** , this session addressed how to gauge student learning and give feedback in an online environment. Various assessment tools were discussed, such as online quizzes, assignments uploaded to an LMS, and live oral assessments. Teachers explored using Google Forms or LMS quiz modules to create formative quizzes that give instant feedback. The concept of authentic assessment was considered – e.g., having students create a short presentation or project relevant to their ESP field and submit via video. The session also included strategies for giving feedback: using written comments, audio feedback files, or scheduling one-on-one consults online. As an activity, teachers reviewed a sample of an ESP student's written

work (provided by the facilitator, anonymized) and practiced giving concise, constructive feedback comments suited for an online medium. This was tied to best practices from TESOL on feedback, emphasizing clarity and encouragement.

- **Session 6: Reflection and Next Steps** – The final session served both as a synthesis and as a reflective conclusion. Teachers revisited the objectives set at the beginning and, in an open discussion, shared to what extent they felt progress had been made. Each participant was asked to identify one concrete change they plan to implement in their next online class as a result of the training. The facilitator guided a reflection using Gibbs' Reflective Cycle prompts, encouraging teachers to consider what they learned, how they felt during the training activities, and how it will impact their teaching. The session also covered planning for the post-training observations: participants were briefed on what the researcher would be looking for, and they were encouraged to apply ideas from the training in a lesson to be observed.

The concept of ongoing professional learning was stressed – teachers were invited to continue exchanging ideas, and resources for further self-study or courses were provided. In essence, this session aimed to empower teachers to carry the momentum forward, resonating with the AR philosophy of continuous improvement.

The syllabus was coherent in that each session built upon the previous ones. For example, tools introduced in Session 2 were applied in Session 3's techniques, and materials created in Session 4 could be used to design assessments in Session 5. By the end of Session 6, participants had experienced a full spectrum of online teaching aspects. The structure of the syllabus deliberately mirrored the training aims and the TPACK model – ensuring technology (Session 2), pedagogy (Session 3 and 5), and content (Session 4) were all addressed, with reflection tying them together (Session 6). The training design thus reflected a blend of theory and practice: it incorporated current research-based recommendations (e.g., active learning,

peer collaboration, iterative practice), while remaining grounded in the everyday realities the teachers faced.

The successful delivery of the training phase not only advanced the digital pedagogy of the ESP teachers but also demonstrated the feasibility of short-term, high-impact professional development in resource-limited contexts.

2.5.2. The Training Phase

The training phase was the action implementation stage of the study – where the plans and syllabus from the pre-training phase were put into practice. Over the course of the six scheduled sessions, the eight ESP teachers participated actively in the professional development program described above. This phase can be characterized as highly interactive and collegial. The atmosphere of the training sessions was purposefully kept collaborative and reflective, rather than top-down lecture style, aligning with the notion that teachers learn best by doing and reflecting, not just by listening (Richards & Farrell, 2005). Here the researcher describe how the training was delivered, highlight some key interactions, and note any adjustments that had to be made on the fly.

All sessions were conducted via Zoom. Each session had an agenda and clearly defined outcomes, but also allowed flexibility to address participants' questions or emerging needs. Attendance was excellent – every participant attended all six sessions (except one teacher who missed part of one session due to an internet outage, but the session recording was provided to her afterwards). At the start of each session, a quick recap of the previous session was done, sometimes with a participant volunteering to summarize (as a way to reinforce their learning). Participants were encouraged to share experiences from trying out any new ideas between sessions. Indeed, a few teachers reported between Session 3 and 4 that they had immediately implemented small techniques (like using a Zoom poll or a breakout discussion) in their classes that week, and they discussed how it went. These debriefings were invaluable “real-world”

feedback moments that enriched the training – they allowed the group to troubleshoot and celebrate early wins.

Throughout the training, there was a strong emphasis on active participation. For instance, during demonstrations of tools or techniques, teachers were not just passive observers; they frequently took control. In Session 2, after the facilitator demonstrated an interactive quiz, one participant volunteered to create a short three-question quiz on the spot for the others to answer, thereby practicing authoring content in the tool. In Session 3's role-play simulation, teachers rotated roles being "instructor" versus "students" in breakout rooms to practice managing an activity. This peer-teaching dynamic served two purposes: it gave teachers a safe space to try leading an online task, and it fostered a sense of mutual support and empathy among the group.

The training phase also incorporated elements of reflective practice. At the end of each session, teachers filled out a quick reflection (via a Google Form or in their handbook) to note one thing they learned and one question they still have. The facilitator reviewed these to inform the next session. For example, after Session 2, several participants noted they learned about new tools but still had questions about how to decide which tool to use when. In response, at the start of Session 3, the facilitator added a brief discussion: "How to choose the right tool for your lesson" and shared a decision-making flowchart, thereby directly addressing that concern. This adaptability is characteristic of action research in practice – the intervention itself was responsive to participants' feedback, embodying continuous improvement.

Another notable aspect was the sense of community that developed among the teachers. Despite being from different institutions, they formed a WhatsApp group early in the training to share quick tips and even humorous observations (like screenshots of their attempt at a new Zoom feature with their students). This peer network provided emotional support – some teachers expressed that knowing others faced similar issues made them feel less isolated in

their struggles with online teaching. The training sessions often had moments where teachers would spontaneously offer each other advice (“In my class I tried X and it worked – you could try it”) which was encouraged by the facilitator as it builds collective wisdom. Such community-building is a well-documented benefit of cohort-based PD (Crafton & Kaiser, 2011), and it certainly manifested here.

One challenge during the training was varying internet connectivity. A couple of participants occasionally had connectivity problems (a common issue in online education, and part of the reality being studied). When someone dropped out due to connection, the session continued but the facilitator or a co-participant would privately message them or record that part so they could catch up. Interestingly, this became a learning point in itself – in Session 3, while discussing online engagement, one teacher raised the scenario: “What do we do if a student has connection issues?” This led to a group brainstorm sharing strategies like recording sessions, providing alternative asynchronous materials, and being flexible with attendance requirements. So, the training was very much grounded in real-time problem-solving as well. Overall, the training phase was successful in delivering the planned content and achieving a high level of teacher engagement. By the final session, participants were actively using the terminology and concepts introduced (e.g., they talked about ensuring *coherence* in their lesson plans, or about *scaffolding* student activities online). They also reported feeling more confident and excited to implement what they learned. This sentiment was captured in remarks during Session 6, such as: “*Now I realize I can make my online classes almost as interactive as face-to-face, I just needed the know-how,*” and “*I’m actually looking forward to trying these ideas out and seeing my students’ reactions.*” Such qualitative feedback hinted at positive changes in teacher attitudes – a critical outcome for professional development efforts, as teacher belief in and enthusiasm for new methods are often prerequisites for lasting change (Guskey, 2002).

To maintain a degree of rigor, the training phase was documented. The researcher kept a journal noting each session's highlights, any deviations from plan, and personal reflections on participant progress. This not only helped in planning subsequent sessions but also constituted data (process data) for later analysis of how the intervention unfolded. For example, the journal noted that by Session 4, all participants were completing tasks faster than in Session 1 – indicating a possible increase in their digital comfort and confidence within a short span. Additionally, all training session Zoom recordings were saved as part of the data (with participants' consent) for potential review when evaluating how actively strategies were practiced.

The training phase was where theory met practice. Teachers actively engaged in *expansive learning* – expanding their skill set by doing and reflecting. The intervention was delivered largely as planned, with minor adjustments based on participant feedback and technical realities. The collegial environment and the structured-yet-flexible format contributed to a rich learning experience. As the training phase concluded, the study moved into the post-training phase, equipped with a cohort of teachers who had new strategies to try out and a supportive mindset to apply them.

2.5.3. The Post-Training Phase

The post-training phase corresponded to the observation and reflection stages of the action research cycle – essentially, evaluating the outcomes of the intervention and solidifying the learning that occurred. In this phase, two main data collection activities took place: (a) Post-Training Classroom Observations of each participant's online teaching, and (b) a Post-Training Feedback Questionnaire (and informal interviews/discussions) to capture the teachers' perspectives on the training's impact. The combination of these measures provided both an external assessment of changes in teaching practice and an internal account of changes in teachers' knowledge, attitudes, and confidence.

Classroom Observations (Post-Intervention): Within two to three weeks after the training program concluded, the researcher conducted a follow-up observation of each teacher's online class, mirroring the pre-training observation process. Using the same observation checklist as before allowed for a direct comparison of specific behaviors and techniques before vs. after the training. During each observation (which was again done via joining a live session or reviewing a recording), the researcher paid particular attention to indicators related to the training content. For instance, was the teacher now using breakout rooms or polls where previously they did not? Had the structure of their lessons changed (e.g., incorporating a clear warm-up or wrap-up activity online)? Were there signs of increased student engagement (more student talking time, more interaction patterns beyond teacher lecture)?

It was encouraging to note that in all eight cases, there were observable enhancements in the teachers' online instructional methods as compared to the baseline observations. To illustrate some general trends: Many teachers incorporated at least one new tool or interactive element learned from the training. One teacher in the engineering ESP course used a live poll at the start of her lesson to recap terminology – something not seen in her pre-training class. Another teacher, who taught Business English, effectively managed breakout room discussions: he gave clear instructions, used the broadcast message feature to guide students, and brought them back for a debrief, demonstrating skills practiced during training. Several teachers improved in providing structured feedback – for example, one teacher was now using the Zoom chat to give quick written feedback and thumbs-up reactions during student presentations, which kept the online session lively (a tactic discussed in Session 5 of the training).

Quantitatively, the observation checklist included some items rated on a scale (e.g., “Level of student interaction: low=1 to high=5”). On average, the ratings for interactive

engagement, use of multimedia, and clarity of lesson structure all increased in the post-training observations compared to pre-training. These differences were not formally statistically tested (given the small sample, statistical analysis would be limited in power), but the pattern was consistently upward. For example, prior to training, many classes were essentially lectures or teacher-led explanation for most of the duration. After training, a typical class included distinct segments: a short interactive opener, a main activity possibly with group work, and a summary – demonstrating better instructional design alignment, which was a key principle taught.

The observations also allowed noting any difficulties or missed opportunities. Not every new technique was perfectly executed; this is natural as teachers refine their skills. For instance, one teacher attempted to use an online quiz during class but encountered a technical glitch – she handled it by quickly moving on and noted to troubleshoot later. Such incidents were later discussed in the reflection debriefing, reinforcing a view of teaching as an ongoing learning process. Importantly, there were no negative effects observed from the training – i.e., no cases where a teacher tried something new that backfired severely or reduced the quality of teaching. This suggests that the training content was realistic and feasible to implement in their contexts.

Feedback and Reflections: After completing the observations, the researcher administered a Post-Training Feedback Questionnaire to the participants (Appendix 6). This instrument collected the teachers' reflections on the training and perceived changes in their competencies. It included Likert-scale items (e.g., "I feel more confident teaching online after this training," rated from Strongly Disagree to Strongly Agree) and open-ended prompts (e.g., "What was the most significant change in your teaching after the training?"). Additionally, the researcher held short individual reflection meetings (approximately 7-10 minutes each, via Zoom) with each teacher. These functioned like semi-structured interviews or guided reflection

chats, where teachers could elaborate on their questionnaire responses and discuss their experiences implementing what they learned.

The feedback from teachers was overwhelmingly positive. On a confidence item, all teachers responded Agree or Strongly Agree that their confidence for online teaching had increased (with a median response of Strongly Agree). They specifically appreciated gaining practical strategies; one teacher wrote, “Before, I was at a loss with student interaction online. Now I have a toolkit of ideas to try, and I’ve seen that they actually work.” Another noted, “I learned how to plan my online lessons better – thinking in terms of phases and not just content.” Many mentioned that the collaborative aspect of the training was motivational – “Knowing others had the same issues and seeing how they tackled them was very helpful,” as one participant put it.

From the qualitative feedback, a few key themes emerged regarding perceived impact:

- Teachers felt they were now better able to engage students. They cited using more questions, discussions, and interactive tasks instead of just lecturing.
- Teachers felt more comfortable with technology tools. The intimidation factor had decreased; even if not all tools were mastered, they at least knew the possibilities and where to start. One teacher said she planned to keep experimenting with one new tool each month, illustrating a newfound proactive attitude.
- Teachers recognized the value of planning and reflection. Several mentioned that going through this process made them more reflective practitioners. They had begun to think about why they choose certain activities and how to improve them, rather than teaching on “auto-pilot.” This development of reflective practice is a hallmark of successful PD (Schön, 1987) and aligns with AR’s goal of transforming practitioners into researcher-minded professionals.

The post-training questionnaire also asked for suggestions or any content they wished had been covered more. A couple of teachers expressed interest in more advanced training on specific tools (e.g., creating video content or learning analytics from LMS). While those were beyond the scope of the initial training, the researcher took note as these could inform future iterations of the PD program or recommendations for institutional training offerings.

In terms of validation of the research outcomes, the convergence of observation data and teacher self-report adds credibility to the findings. Where teachers said they changed certain practices, the observations generally corroborated those changes – a form of triangulation that strengthens the validity of conclusions. Moreover, having teachers articulate their learning in their own words provided a form of member checking: it ensured that the researcher’s interpretation of “improvement” matched what participants themselves valued and noticed, thus reinforcing the trustworthiness of the evaluative aspect of the study (Lincoln & Guba, 1985).

Finally, the post-training phase involved consolidating the lessons learned (specifying learning in AR terms). In a concluding action research meeting (which doubled as a final reflective focus group, although conducted online), the researcher and participants together summarized outcomes and discussed next steps. The teachers made recommendations such as continuing this community of practice, perhaps meeting informally once a month to share experiences, and extending invitations to other colleagues to join (scaling up the impact). They also brainstormed possible future cycles – for example, one teacher suggested that the group could collaboratively develop a repository of online ESP teaching activities as a project. These ideas indicate a sense of empowerment and initiative kindled by the project, which is a desirable outcome going beyond the initial scope. From a research perspective, the post-training phase provided the data necessary to answer the research questions about how the PD intervention impacted teacher practices and perceptions.

The post-training phase was a critical part of closing the loop in this action research. It evaluated the effectiveness of the intervention through multiple lenses and ensured that the knowledge gained was articulated and could inform future practice. The positive changes noted and the enthusiastic reflections suggest that the action research achieved its immediate objectives. Additionally, this phase set the stage for potential further action research cycles, in keeping with the idea that educational improvement is an ongoing journey rather than a one-time fix.

2.6. Instrumentation

To support and validate the research findings, the researcher used various instruments and methods as part of a mixed-method approach. The mixed-method approach implies that usually both quantitative and qualitative data have been introduced and dealt with at the levels of both data collection and analysis. To meet this end, careful selection of the research instruments is needed to make possible a triangulation of data sources, instruments, and methods. This section details the instruments employed in the study and justifies their selection within the methodological framework of action research.

2.6.1. Research Questionnaire : Needs Analysis Design and Rationale

The Needs Analysis Questionnaire served as the primary instrument for the Pre-Training Phase, designed to diagnose the specific professional development needs of ESP teachers and establish a baseline of their current competencies, challenges, and training expectations. This instrument was grounded in established needs analysis frameworks in ESP (Dudley-Evans & St. John, 1998; Hutchinson & Waters, 1987) and questionnaire design principles (Oppenheim, 1992; Cohen, Manion, & Morrison, 2018).

According to Oppenheim (1992), a questionnaire is not just a list of questions or a form to be filled in. It is essentially a measurement tool, an instrument for the collection of particular kinds

of data. In the context of this study, needs analysis is the cornerstone of course and program design, identifying the gap between learners' current competencies (Present Situation Analysis, PSA) and the skills they must develop for their target professional context (Target Situation Analysis, TSA). Adapted for this study, the Needs Analysis Questionnaire assessed teachers' present situation (current digital literacy, online teaching experience, and pedagogical competencies) and target situation (required competencies for effective online ESP instruction). This dual focus enabled the research team to design the subsequent training intervention precisely targeting identified gaps.

Hutchinson and Waters (1987) emphasize that effective needs analysis requires a comprehensive understanding of what learners need to do in their target situation and what their present linguistic and communicative capabilities are. Adapted for this study, the Needs Analysis Questionnaire assessed teachers' present situation (current digital literacy, online teaching experience, and pedagogical competencies) and target situation (required competencies for effective online ESP instruction). This dual focus enabled the research team to design the subsequent training intervention precisely targeting identified gaps, ensuring that professional development was responsive to actual teacher needs rather than based on assumptions or generic models.

2.6.2. Observation Instruments: Pre-Training and Post-Training Checklists Grid

Observation was used in this study as a central instrument for examining teachers' actual pedagogical practices in online ESP settings before and after the training intervention. While questionnaires and feedback responses provided insight into teachers' perceptions and experiences, the observation grid made it possible to document what teachers were actually doing in their virtual classrooms. In this sense, observation complemented self-reported data and strengthened the study by providing direct evidence of teaching practice.

The observation grid used in this study was adapted by the researcher (check the Appendix 11) and was inspired by Borich's (2016) model of effective teaching. Borich's framework was selected because it offers a structured and pedagogically grounded approach to classroom observation, focusing on key dimensions of teaching performance that are relevant across instructional settings. However, since the present study focused specifically on online ESP teaching, the original model was not used in its original form. Instead, the researcher adapted it to suit the objectives of the study and the realities of synchronous online instruction in Algerian higher education.

More specifically, the adapted observation grid was designed to capture dimensions of teaching that were especially relevant to online ESP pedagogy. These included lesson planning and organization, use of digital tools and platforms, interaction and communication with learners, student engagement strategies, clarity of instruction, and adaptation of content to the online environment. The grid also considered ESP-specific teaching practices, such as the relevance of tasks to learners' disciplinary or professional contexts and the teacher's ability to support meaningful communication rather than merely transmit content. In this way, the instrument moved beyond a generic observation checklist and became more closely aligned with the actual focus of the study.

The observation grid was used twice during the study: first in the pre-training phase and then again in the post-training phase. In the pre-training phase, it functioned as a diagnostic instrument that helped identify baseline strengths, limitations, and professional development needs among the participating teachers. In the post-training phase, the same grid was used to examine whether and to what extent changes had occurred in teachers' online pedagogical practices following the intervention. Using the same observation framework across both phases made it possible to compare performance more systematically and to identify areas of improvement as well as dimensions in which challenges persisted.

The use of an observation grid was particularly valuable in this study because online teaching competence cannot be assessed adequately through perception data alone. Teachers may report increased confidence or improved understanding after training, but observation provides a more direct view of how such changes are translated into practice. For example, it allows the researcher to examine whether teachers used more interactive techniques, integrated digital tools more effectively, organized lessons more clearly, or demonstrated greater responsiveness to students during online sessions. The observation instrument therefore played a crucial role in linking the training intervention to observable pedagogical change.

To ensure that the grid was appropriate for the context of the study, the adaptation process involved aligning the observation categories with the objectives of the training programme and the realities of Algerian online ESP instruction. This means that the instrument was not intended simply to evaluate general teaching quality, but to examine practices directly related to the competencies targeted by the intervention. In this respect, the observation grid contributed both to the needs analysis stage and to the evaluation of the intervention outcomes. It was therefore not only a measurement tool, but also a key link between the research questions, the training content, and the interpretation of findings.

Finally, the observation data generated through this grid were used alongside questionnaire and feedback data as part of the study's mixed-methods design. Their inclusion enhanced the credibility of the findings by allowing the researcher to compare teachers' reported experiences with evidence from observed teaching practice. This strengthened the overall analytical framework of the study and supported a more nuanced understanding of ESP teachers' professional development for online pedagogy.

2.6.3. Training Sessions as Intervention

While the training sessions themselves constituted the primary intervention in this action research study, they also functioned as instruments for data collection and as

operationalized expressions of the study's theoretical framework. According to Creswell and Creswell (2018), in mixed-methods action research, interventions serve dual purposes: they directly implement change aimed at improving practice while simultaneously generating data on implementation fidelity, participant engagement, and emerging outcomes.

The training program was designed based on the TPACK framework (Technological Pedagogical Content Knowledge) introduced by Mishra and Koehler (2006). TPACK represents an integration of three distinct but interconnected knowledge domains essential for effective teaching with technology. TPACK posits that effective teaching, particularly with technology, requires the intersection of three knowledge domains: (1) Technological Knowledge (understanding digital tools, their capabilities, limitations, and technical features), (2) Pedagogical Knowledge (understanding learning theories, instructional strategies, classroom management, and assessment approaches), and (3) Content Knowledge (subject matter expertise in ESP, understanding of language systems, discourse patterns, and domain-specific vocabulary). Mishra and Koehler (2006) argue that technology integration fails when teachers possess only one or two of these domains; for example, a teacher with strong content knowledge but weak pedagogical knowledge may use technology for transmission of information rather than active learning. The training deliberately integrated all three elements, ensuring teachers developed not merely technical proficiency with tools but pedagogically sound, content-informed technology integration appropriate for ESP instruction contexts.

2.6.4. Feedback Questionnaire

Participant feedback is critical in action research for understanding how an intervention is perceived and experienced by those involved. According to ScharTEL (2012), feedback from learners provides essential information about program quality, relevance, and areas for refinement. In the context of professional development, teacher feedback reveals not only satisfaction (liking the program) but also perceived applicability (relevance to actual practice)

and confidence (belief in capability to implement) both of which are predictive of actual behavior change. Scharrel emphasizes that feedback is an integral part of education, functioning as a mechanism for learners to understand their performance and guides improvement in both teaching practice and program design. Without learner feedback, program designers cannot know whether a training addressed participant needs, whether content was clear and engaging, or whether teachers actually believe they can use new strategies in their classrooms.

In this study, the Feedback Questionnaire served multiple purposes simultaneously: it collected data on teacher satisfaction and perceived learning gains; it captured teachers' judgments about the relevance of training content to their actual teaching contexts; it documented perceived confidence changes from pre- to post-training; and it gathered qualitative information on which training components were most valuable and where gaps remained. This multi-purpose design reflects the efficiency goals of action research, where data collection is streamlined to address multiple research questions through carefully designed instruments.

Instrument	Purpose	Phase
Research Questionnaire	To identify teachers' needs, technological skills, and pedagogical challenges	Pre-Training Phase
Pre-Observation Checklist	To assess participants' initial online teaching practices and class management	Pre-Training Phase
Training Sessions	To provide targeted professional development based on TPACK framework	Training Phase
Post-Observation Checklist	To evaluate improvements in teaching practices after the training intervention	Post-Training Phase

Feedback Questionnaire	To collect participants' reflections and satisfaction with the training program	Post-Training Phase
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Table 2. 4: Research Instruments Used in the Study

2.7. Data Analysis Methods

Given the study’s mixed-methods design, data analysis was conducted separately for quantitative and qualitative data strands before integrating the findings. This approach follows recommended practice in mixed-methods research – analyze each component thoroughly and then combine results to see how they corroborate or complement each other (Creswell & Plano Clark, 2011). The overall aim of the analysis was to determine the extent to which the professional development intervention achieved its objectives and to understand the nuances of how it impacted the participants. Ensuring rigor in analysis was also a priority; multiple validation strategies such as triangulation of data sources and member checking were employed to enhance credibility of the results.

In line with Dörnyei’s (2007) guidance that mixing methods can provide “a more complete understanding of a research problem than either quantitative or qualitative approaches alone”, the study sought to illuminate teacher development from both measurable outcomes and rich narrative evidence. The quantitative analysis offers objective indicators of change (e.g., improvements in observation checklist scores, shifts in questionnaire ratings), while the qualitative analysis explores the subjective experiences and perceptions behind those changes. By converging these analyses, the study can more confidently assert its conclusions (methodological triangulation), thereby strengthening internal validity. Below, the procedures for quantitative and qualitative data analysis are detailed, followed by a note on integration and validation.

2.7.1. Quantitative Data Analysis

The quantitative data in this study derived from several sources: the structured portions of the Needs Analysis Questionnaire (pre-training), the Observation Checklists (pre- and post-training), and the closed-ended items in the Feedback Questionnaire (post-training). These data were coded numerically and analyzed using the Statistical Package for the Social Sciences (SPSS, Version 25). Prior to analysis, all datasets were cleaned and prepared – responses were checked for completeness, any obvious data entry errors were corrected, and negatively worded items (if any) were reverse-coded so that higher numeric values uniformly indicated “more positive” outcomes (for instance, if “1” meant high confidence and “5” meant low confidence on some scale, that would be reversed for consistency).

Descriptive statistics were the main analytical techniques, given the small sample size ($n=8$) and the primarily descriptive objectives of the study. Frequencies, means, and standard deviations were computed for key indicators. For example, in the needs analysis, the mean self-rating of confidence in online teaching (on a 5-point scale) was calculated to establish a baseline. In the post-training feedback, the percentage of teachers agreeing or strongly agreeing with statements like “The training met my needs” was tabulated. Such descriptive results provided a clear overview of trends and were useful for straightforward comparisons.

A particularly informative quantitative analysis was the comparative analysis of pre- and post-intervention observation scores. Each teacher had a set of ratings from the initial observation and the follow-up observation. Although the sample was too small for robust inferential statistical testing, a simple comparison was done for each relevant item. For instance, if “student interaction level” was rated 2/5 pre-training and 4/5 post-training for a teacher, that was recorded as an improvement. All teachers’ scores were compiled to see if a general pattern emerged. Indeed, as alluded to earlier, there was a consistent upward trend across most categories (with some individual variation in magnitude). For reporting, this can

be summarized as “X out of eight teachers showed improvement in category Y, with the mean score increasing from A to B.” Where applicable, effect size measures (like Cohen’s d) were considered to gauge the magnitude of change, but given the descriptive nature, they were not heavily emphasized.

The needs analysis questionnaire data were also used quantitatively to tailor the training (though those results are more relevant to Chapter Four’s context of initial conditions). Another small set of quantitative data came from the participant profile summary (Table 3.2), which was not analytical but provided context (e.g., average years of teaching experience). This was used mainly to describe the sample and, in analysis, to consider if factors like experience correlated with ease of adopting new methods (with such a tiny sample, this was speculative; no clear correlation emerged, except possibly that the more tech-savvy individuals leapt further ahead, but even less tech-savvy improved significantly with support).

All quantitative results were organized in tables and graphs for clarity. For example, a bar chart was prepared to visualize the average pre- vs post-training observation ratings across various domains (planning, engagement, use of tech, etc.), which showed a uniform rise post-training. Similarly, a bar graph depicted the distribution of responses on key feedback items (like confidence increase). These visualizations aided interpretation and were included to help communicate findings to stakeholders.

Throughout the quantitative analysis, internal validity considerations were kept in mind. The use of consistent instruments at pre and post (e.g., the same observation checklist) helped ensure that changes reflected actual differences rather than measurement inconsistencies. By integrating multiple quantitative measures (observation and self-report), the study leverages the idea of triangulation: if both an external rating and a self-rating point to improvement, confidence in that improvement is higher. In this study, that was indeed the

case for most measured aspects – providing a reassuring consistency in the quantitative narrative of change.

2.7.2. Qualitative Data Analysis

The qualitative data in this study were analyzed using qualitative content analysis and thematic analysis. The analysis began with the preparation and organization of the data. The post-training interviews were audio-recorded with participants' permission and then transcribed. The open-ended questionnaire responses were already available in written form. In addition, observation notes and the researcher's reflective journal entries were typed and organized to facilitate systematic analysis.

Given the relatively small sample size and the manageable volume of qualitative data, the analysis was conducted manually rather than through specialized qualitative data analysis software. This manual approach allowed the researcher to engage closely and repeatedly with the data and to identify patterns, meanings, and recurring issues across participants' responses and observations.

The first stage of analysis involved careful reading and re-reading of the data in order to gain familiarity with the content. During this stage, initial codes were generated inductively from the data. These codes represented recurring ideas, experiences, and concerns expressed by participants, and in some cases remained close to participants' own wording. Examples of initial codes included increased student interaction, greater confidence, technical difficulties, peer collaboration, and need for further practice. The pre-training data were coded to identify baseline needs and challenges, such as limited familiarity with digital tools, difficulty engaging students online, and uncertainty about online teaching strategies. The post-training data were then coded to identify developments, perceptions of change, and continuing concerns.

In the second stage, the coded data were examined for broader patterns and grouped into categories and emerging themes. Through this process, related codes were clustered under

larger thematic areas. For example, codes related to greater use of digital tools, improved lesson organization, and more interactive classroom techniques were grouped under a theme such as changes in teaching practice. Codes reflecting participants' feelings of increased motivation, confidence, and professional awareness were grouped under changes in teacher attitudes and confidence. Similarly, statements referring to remaining constraints, difficulties, or unresolved issues were grouped under ongoing challenges and considerations. Another theme captured participants' evaluation of the training experience itself, particularly the aspects they found most useful, such as practical activities, peer exchange, and hands-on learning.

These themes were reviewed and refined iteratively by constantly comparing them with the original data to ensure that they were clearly supported by the participants' responses and remained analytically distinct. To enhance the trustworthiness of the analysis, a form of peer review was used. A colleague who was not involved in the research reviewed a sample of the data, the coding decisions, and the developing themes. Although this process did not constitute formal inter-coder reliability, it provided an external check on the coherence and credibility of the interpretation.

Throughout the analysis, the researcher also engaged in reflexivity, acknowledging their dual role as both researcher and trainer in the intervention. Attention was given to the possibility that participants might emphasize positive aspects of the training experience. However, the inclusion of critical comments, references to continuing challenges, and suggestions for improvement indicated that participants were willing to provide balanced and honest feedback. To preserve participants' perspectives and minimize over-interpretation, the findings in Chapter Three are supported by direct excerpts from the qualitative data.

2.7.3. Triangulation and Validation Strategies

To ensure the quality and trustworthiness of the research findings, several validation strategies were embedded in the research design and analysis. First, triangulation has been

mentioned multiple times: the use of multiple data sources (questionnaires, observations) and multiple methods (quantitative and qualitative) to corroborate results. Triangulation in this study strengthened confidence in conclusions; for example, improvements in teaching practice were evidenced by both observation data and teacher testimony, and increased teacher confidence was reflected in both survey ratings and interview narratives, providing convergent validation.

Second, member checking was utilized, particularly during the post-training interviews and the final reflection meeting. The researcher would summarize what they perceived as the main changes or outcomes and asked participants if that resonated with their experience. For instance, the researcher might say, “It sounds like you feel more confident using interactive activities now – is that accurate?” allowing the participant to affirm or clarify. All participants agreed with the summarized positive outcomes, and some added nuance (e.g., “Yes, more confident, though I still worry about time management.”). This process ensured that the researcher’s interpretations aligned with participants’ own views, thereby enhancing the credibility of qualitative interpretations (Lincoln & Guba, 1985).

Third, the research design incorporated expert validation of instruments. The needs analysis questionnaire and observation checklist were developed based on established literature and then reviewed by two experienced ESP teacher educators prior to use. Their feedback helped ensure that the questions and checklist items had content validity – they indeed covered relevant aspects of online ESP teaching and teacher development. A small pilot test of the needs analysis was done with two non-participating teachers, leading to minor clarifications in wording. Similarly, the training materials and plans were discussed with a mentor to validate that they were pedagogically sound. While these steps were preparatory in nature, they contributed to obtaining reliable data and effective intervention results.

Fourth, reliability measures were applied to observation data. Although only one researcher formally observed the classes, an effort was made to maintain consistency by using a well-defined checklist and by training oneself (through practice observations) to apply the criteria uniformly. Additionally, one post-training class was co-observed by a colleague (for ethical reasons this was done only for a volunteer participant and with permission) to see if there was agreement on the ratings. The inter-observer discussion indicated high agreement on most points, boosting confidence that the observation assessments were not arbitrary. Quantitative data entry was double-checked to avoid errors, and all calculations were re-run after a break to ensure consistency (a simple intra-rater reliability technique for data analysis).

Finally, the study upheld ethical standards throughout, which indirectly supports validity because participants are more likely to respond honestly when they trust the research process. By assuring confidentiality and making it clear that the aim was developmental (not evaluative in a punitive sense), teachers were open in sharing their genuine opinions and even criticisms. For example, some participants openly admitted where they still felt unsure or what aspects of training were less useful, information they might have withheld if they felt judged. Ethically, participants were also given the opportunity to review a draft of the findings (especially any quotes from them) to confirm accuracy. Two participants provided minor clarifications on their quotes' context, which were incorporated.

2.8. Conclusion

This chapter has presented a detailed account of the research methods and procedures employed in the study, which aimed at improving ESP teachers' professional development for online pedagogy. The chapter began by establishing the methodological foundation: a participatory action research approach was chosen for its alignment with practitioner-led improvement and its flexibility to incorporate a mixed-methods design. The research design

was visualized as a multi-phase process flowing from needs assessment to intervention to evaluation, ensuring each component of the study was logically connected and grounded in both theory and the realities of the educational context.

CHAPTER THREE

DATA ANALYSIS AND

DISCUSSION

CHAPTER THREE: DATA ANALYSIS AND DISCUSSION

3.1. Introduction

3.2. Data Analysis and Interpretation

3.2.1. The Pre-Training Phase Results

3.2.1.1. Needs Analysis Research Questionnaire

3.2.1.2. Pre-Training Observation

3.2.2. The Training Phase Results

3.2.3. The Post-Training Phase Results

3.2.3.1. Post-Training Observation Results

3.2.3.2. The Post-Training Feedback

3.3. Discussion of Findings

3.4. Implications of the Study

3.4.1. Implications For ESP Teacher Training

3.4.2. Implications For Online Pedagogy

3.5. Conclusion

3.1. Introduction

The study was conducted to examine whether training ESP teachers could help them respond more effectively to the demands of online teaching and improve their professional competence in online pedagogy. This chapter addresses the research questions and hypotheses introduced earlier. This could be done going through the analysis and the interpretations of the data gathered during the three phases of this action research.

3.2. Data Analysis and Interpretation

The research work was divided into three phases: pre, during, and post the training sessions. The analysis and the interpretation of the data gathered at the three phases was done following the same order of the previous chapter.

3.2.1. The Pre-Training Phase Results

During the first phase, the researcher opted for the use of two instruments: a needs analysis questionnaire and pre-training observation. In the section below the results gained from each instrument will be outlined carefully.

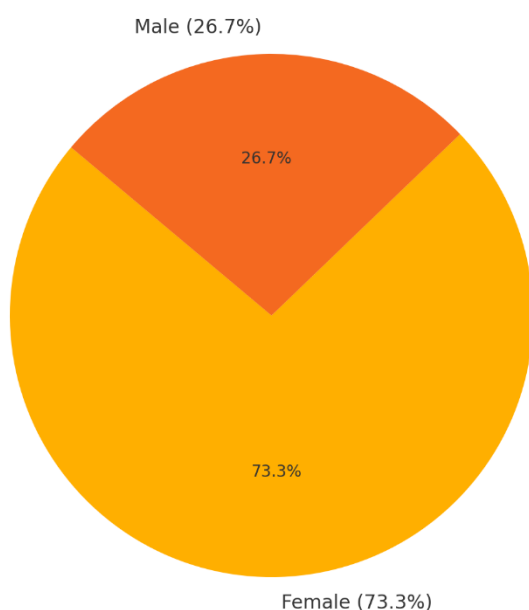
3.2.1.1. Needs Analysis Research Questionnaire

The initial stage involved administering a structured questionnaire to 15 ESP teachers in Algerian higher education with the aim of identifying their needs and challenges in relation to online teaching. The questionnaire was composed of five major sections: (1) Demographic Information, (2) Digital Literacy and Technological Experience, (3) Online Teaching Practices, (4) Challenges and Skill Gaps, and (5) Attitudes and Professional Development Intentions. The results are analyzed question by question below.

Section A: Teacher Profiles and Demographic Information

Q1. What is your gender?

Analysis of this item revealed a significant female majority among the participants. Out of fifteen respondents, eleven (73.3%) were female, while only four (26.7%) were male. This gender ratio reflects the increasing representation of women in Algeria's academic teaching field, particularly within humanities and language-related disciplines. It suggests that gender-responsive strategies in teacher training may be beneficial, especially in terms of engagement and inclusion in professional development initiatives.

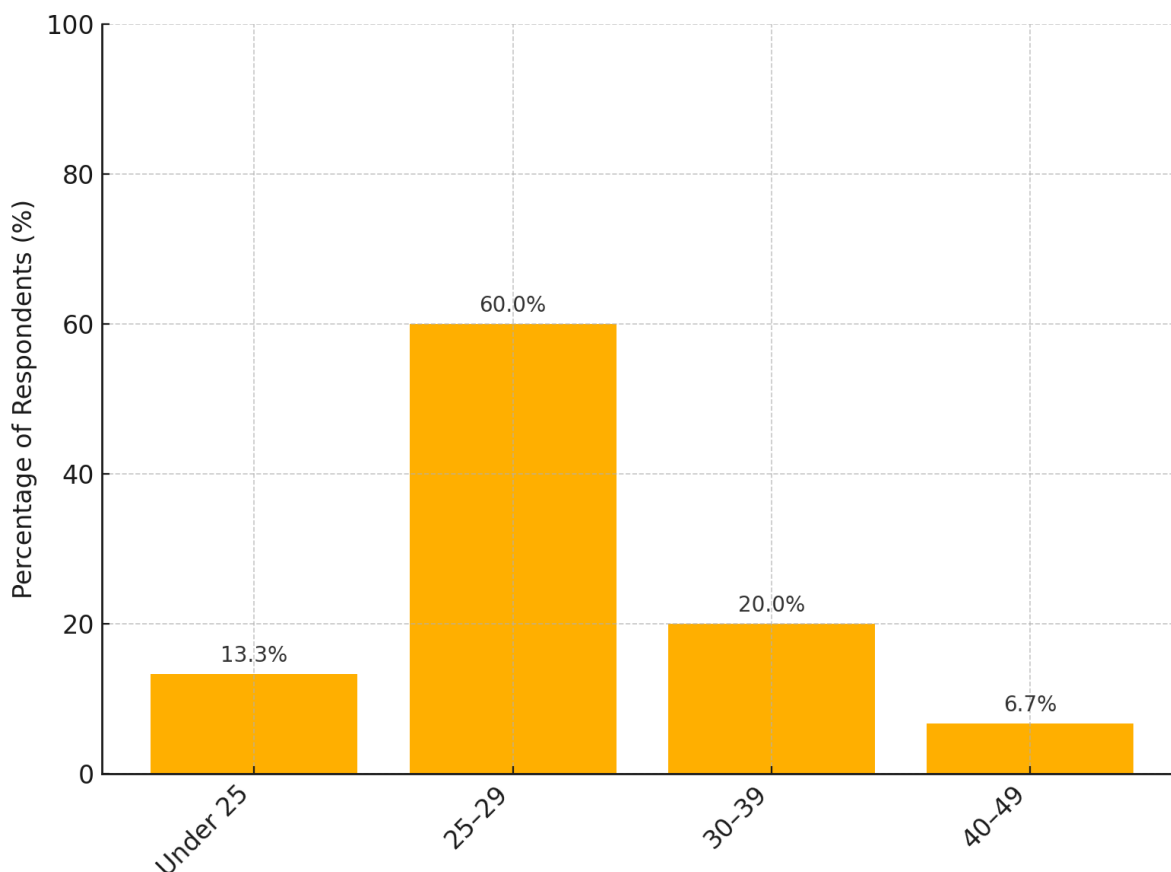


Pie Chart 3. 1. Gender Distribution of Participants

Q2. What is your age?

The majority of the teachers fell within the younger age brackets, with **60% (n=9)** aged between **25–29**, followed by **20% (n=3)** aged **30–39**, **13.3% (n=2)** under **25**, and only **6.7% (n=1)** between **40–49**. This reflects that most ESP practitioners surveyed are early-career

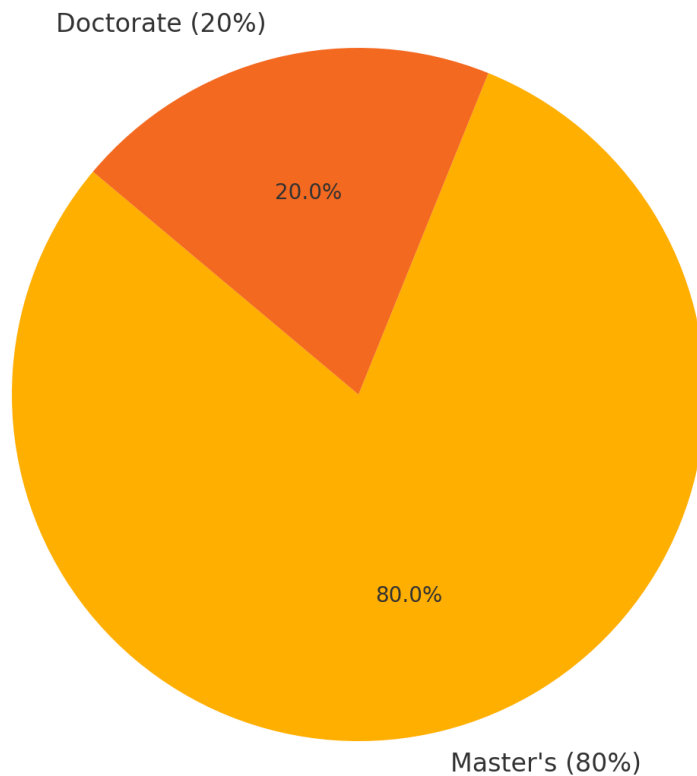
professionals, a group often characterized by adaptability to digital innovation but requiring pedagogical support. Their openness to new teaching approaches provides a strong foundation for capacity-building programs.



Bar Chart 3. 1. Age Group of ESP Teachers

Q3. What is the highest level of formal education that you have completed?

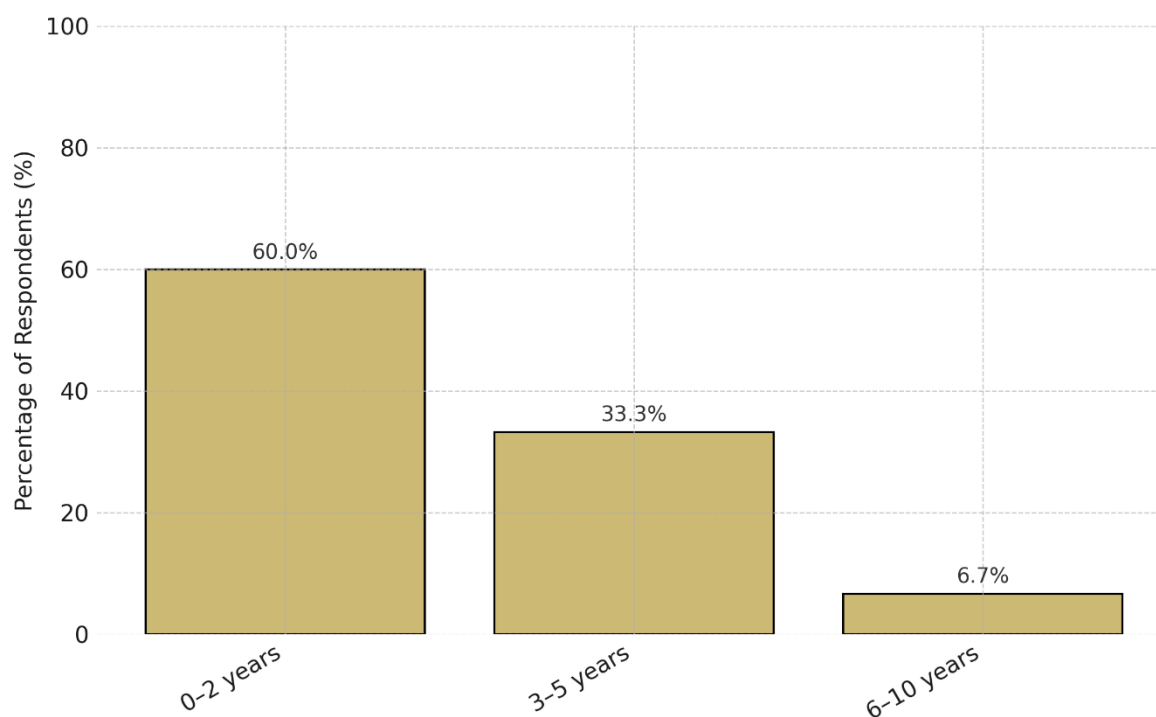
Out of 15 participants, 12 (80%) held a Master's degree, while 3 (20%) held a PhD. This indicates a generally well-qualified group. However, high academic qualification does not necessarily equate to readiness for online pedagogy, as further results reveal and potentially lacking specific training in digital pedagogy despite academic credentials.



Pie Chart 3. 2. Academic Qualifications of Participants

Q4. What is your experience in ESP teaching?

Regarding ESP teaching experience, **60% (n=9)** of respondents had between 0–2 years, **33.3% (n=5)** had 3–5 years, and only **6.7% (n=1)** had more than 6 years of experience. These findings highlight that the majority are relatively new to the ESP domain, which may explain their uncertainty in course design and subject-specific language instruction. It also reinforces the need for an introductory and context-aware ESP teacher development program

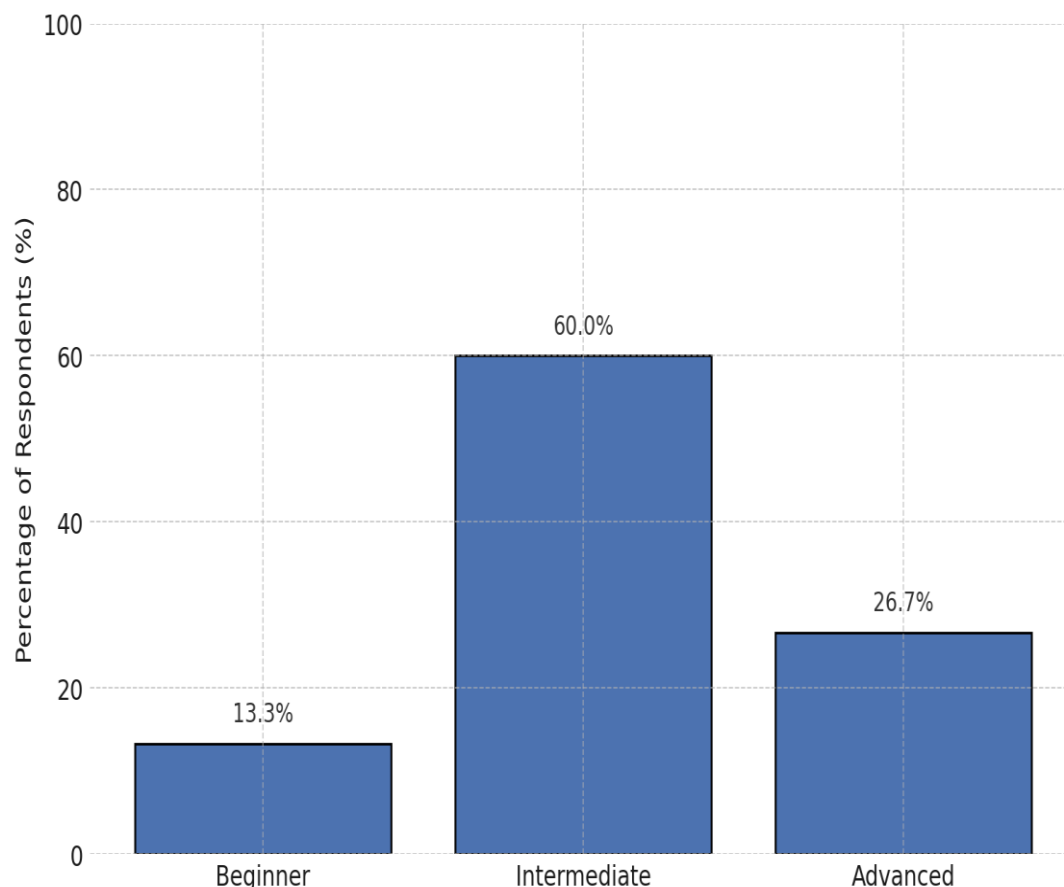


Bar Chart 3.2. ESP Teaching Experience by Years

Section 2: Digital Literacy and Technological Experience

Q5. How would you rate your general proficiency with digital tools?

Teachers self-assessed their general digital literacy as follows: **60% (n=9)** rated themselves as **intermediate**, **26.7% (n=4)** as **advanced**, and **13.3% (n=2)** as **beginner**. Although these figures seem encouraging, further analysis suggests that self-perception may not match actual digital pedagogy competence. Many teachers equate daily digital use (email, Word, Google) with instructional design proficiency, highlighting a gap between familiarity and effective implementation.



Bar Chart 3.3. General Digital Proficiency Levels

Q6. Which digital platforms are you familiar with for online teaching?

Teachers self-assessed their general digital literacy as follows: 60% (n=9) rated themselves as intermediate, 26.7% (n=4) as advanced, and 13.3% (n=2) as beginner. Although these figures seem encouraging, further analysis suggests that self-perception may not match actual digital pedagogy competence. Many teachers equate daily digital use (email, Word, Google) with instructional design proficiency, highlighting a gap between familiarity and effective implementation.

These findings in the below table 1.1 suggest teachers are most familiar with general communication tools but have limited engagement with LMS-specific platforms necessary for structured online learning.

It is evident that Zoom and Google Meet are the dominant tools used, likely due to their accessibility and ease of use for synchronous teaching. In contrast, Moodle and Google Classroom, which allow for structured asynchronous instruction, are used less frequently. This suggests a pattern of reliance on live interaction platforms and underutilization of environments that support sustained learner autonomy and assessment.

The limited mention of structured LMSs may be due to lack of institutional support, insufficient training, or a misconception that online teaching equals videoconferencing. Training programs should prioritize bridging this understanding gap and guide teachers toward integrating asynchronous modalities.

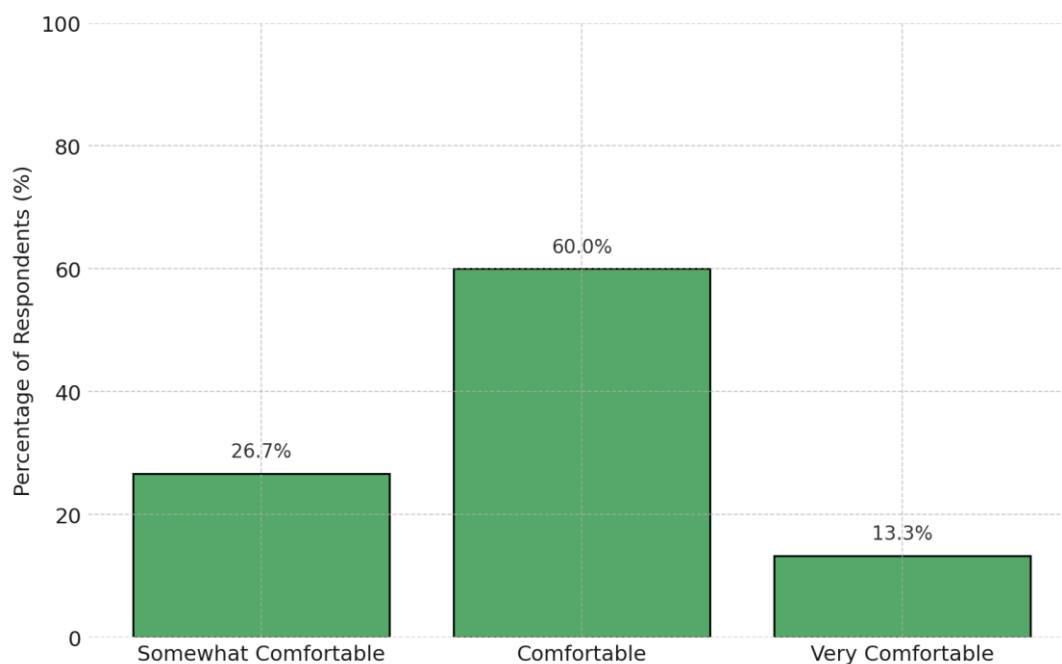
Platform	Number of Mentions
Zoom	13
Google Meet	11
Microsoft Teams	8
Moodle	6
Google Classroom	5

Table 3. 1. Digital Proficiency Levels

Q7. How comfortable are you with using LMS (Learning Management Systems)?

In terms of LMS use, **60% (n=9)** reported feeling **comfortable**, **26.7% (n=4)** indicated being **somewhat comfortable**, and **13.3% (n=2)** were **very comfortable**. These results show that most respondents are willing to use LMSs, but the depth of this usage remains questionable. Despite the reported comfort, this must be interpreted cautiously. Previous responses show low usage of structured LMS platforms like Moodle or Classroom, implying that what teachers perceive as “LMS” may often refer to simplified tools (e.g., Google Forms or WhatsApp groups). Furthermore, no teacher selected “Uncomfortable,” which may suggest a social desirability bias or limited awareness of what robust LMS use entails (e.g., grading systems, embedded quizzes, tracking participation, asynchronous discussions).

A deeper LMS training module is needed that walks teachers through course creation, student progress monitoring, and interactive components. Comfort needs to be matched with practical application and support.



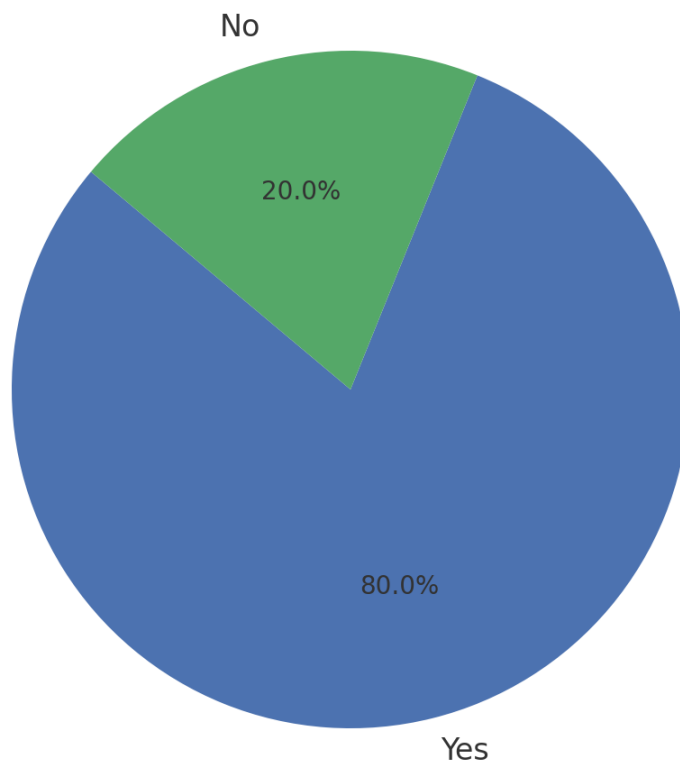
Bar Chart 3. 4. LMS Comfort Level

Section 3: Experience with Online Teaching

Q8. Have you taught an online ESP course before?

A large majority, **80% (n=12)** of the teachers, indicated that they had taught online ESP courses previously, while **20% (n=3)** had not. This result demonstrates widespread exposure to digital learning environments. However, as revealed in later questions, such experience was not always structured or pedagogically sound. In many cases, the move to online teaching was reactive rather than strategic, particularly during the early stages of the COVID-19 pandemic. It is important to note that during and after the COVID-19 era, many Algerian faculties introduced or maintained online course offerings—either in blended formats or as entirely remote modules. As such, it is not surprising that the majority of respondents had experience teaching ESP online. Nevertheless, this experience may have been limited to delivering content via platforms like Zoom or WhatsApp without formal training in digital pedagogy, course design, or learner engagement strategies.

The existence of prior online teaching experience does not automatically indicate readiness or effectiveness. Rather, it underscores the need to convert emergency-driven digital exposure into reflective, theory-informed teaching practices through continuous professional development.



Pie Chart 3.3. Prior Experience in Online ESP Instruction

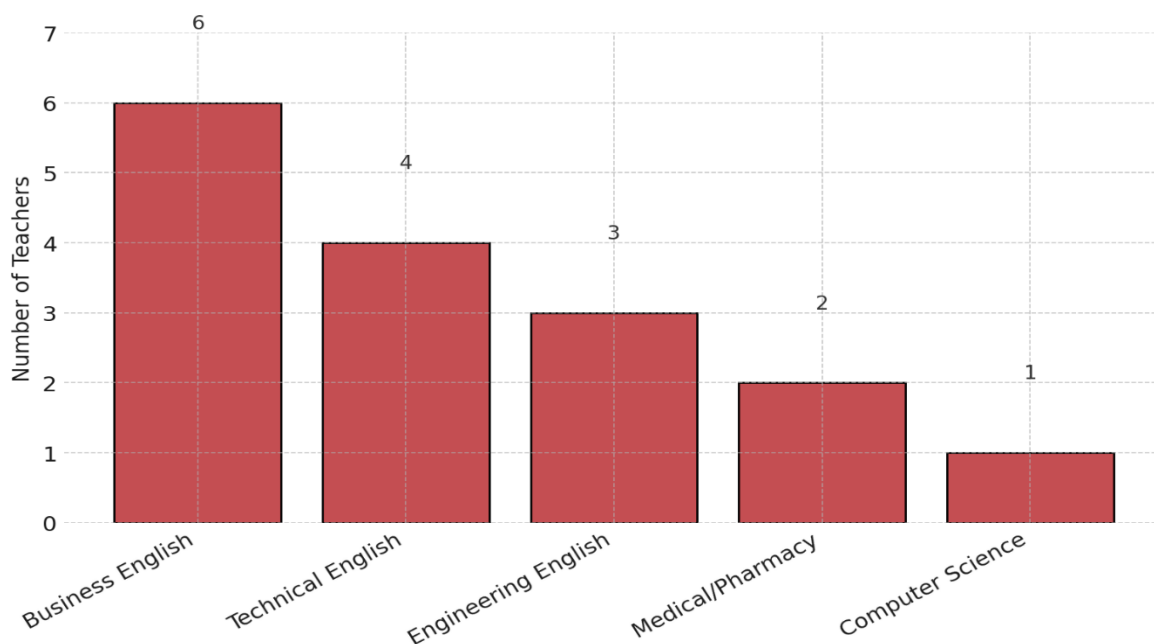
Q9. Which ESP course have you taught before?

To better understand the disciplinary focus of the respondents' teaching backgrounds, this question invited participants to indicate which ESP course(s) they had taught prior to the study.

The responses revealed a range of subject-specific courses:

- **Business English** was the most frequently cited, mentioned by 6 participants.
- **Technical English** (4 mentions) and **Engineering English** (3 mentions) were also common.
- Other fields included **Medical/Pharmaceutical English** (2 mentions) and **Computer Science English** (1 mention).

This disciplinary diversity confirms that ESP instruction in Algeria is not limited to one academic stream. It also highlights the need for training programs to be adaptable and sensitive to field-specific terminology, genres, and communication tasks. Since each ESP context has its own discourse conventions and communicative practices, teacher development initiatives should integrate field-oriented modules and resources.

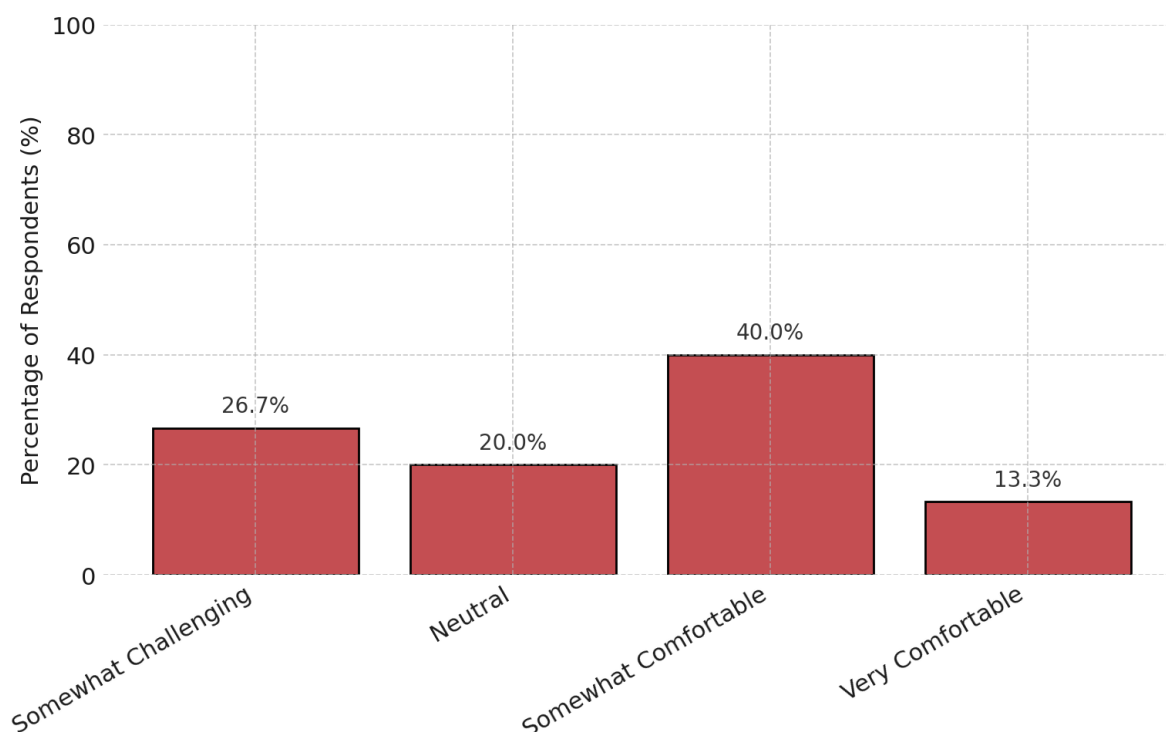


Bar Chart 3. 5. ESP teachers' subjects

Q10. How would you describe your experience with online teaching?

The participants' experience levels with online teaching varied: **40% (n=6)** felt **somewhat comfortable**, **26.7% (n=4)** found it **somewhat challenging**, **20% (n=3)** were **neutral**, and **13.3% (n=2)** reported **very challenging** experiences. This distribution suggests that nearly half of the respondents still struggle with navigating online classrooms effectively. While some have gained basic comfort, others are hindered by technical, motivational, or design-related challenges. Online teaching experience was often acquired under pressure, and

confidence remains uneven. Structured support is needed to reinforce effective strategies and increase teacher comfort.

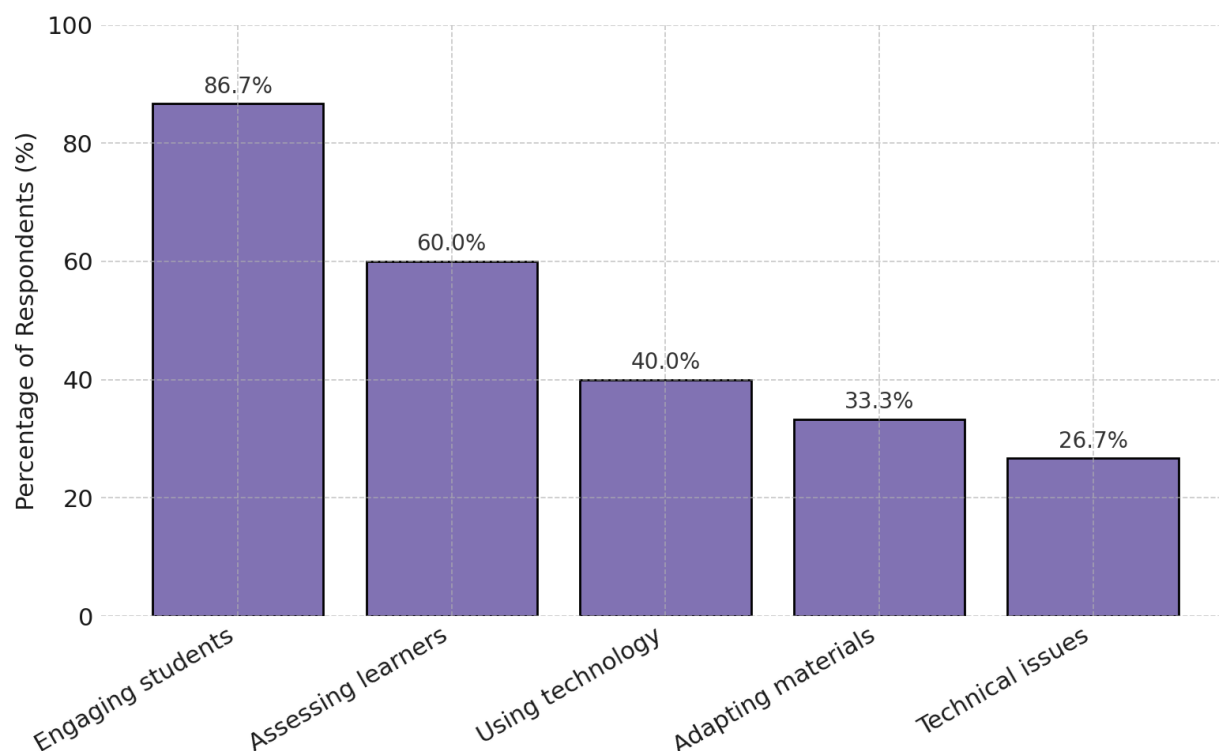


Likert Bar Chart 3. 6. Perceived Online Teaching Experience

Q11. Which aspects of online teaching do you find most challenging? (Select all that apply)

Teachers identified several recurring challenges: **86.7% (n=13)** found student engagement the most difficult aspect, followed by **60% (n=9)** who struggled with assessing learners online. Additionally, **40% (n=6)** reported difficulties in using technology effectively, while **33.3% (n=5)** noted trouble with adapting materials for digital delivery. A further **26.7% (n=4)** pointed to technical issues such as poor connectivity.

The emphasis on engagement and assessment challenges suggests a lack of exposure to task-based, student-centered learning models online. These areas must be central to future training initiatives.



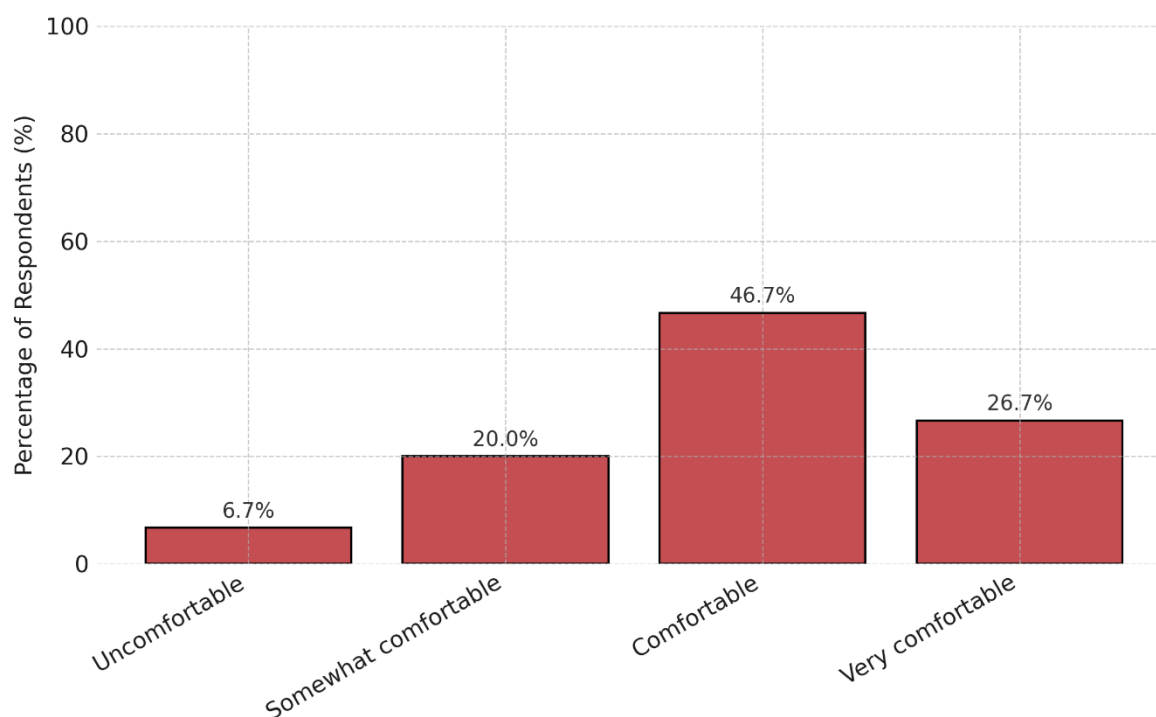
Bar Chart 3. 7. Main Challenges in Online Teaching

Section 4: Comfort and Training Needs

Q12. How comfortable are you with creating interactive content for online courses (e.g., quizzes, discussion boards)?

When asked about designing interactive digital materials, **46.7% (n=7)** of the participants said they felt comfortable, and **26.7% (n=4)** rated themselves as *very* comfortable. Meanwhile, **20% (n=3)** felt only somewhat comfortable, and **6.7% (n=1)** reported being *uncomfortable*. These results suggest that most teachers have some confidence in using tools like quizzes, polls, or collaborative boards. However, variation in responses points to disparities in tool mastery and confidence levels.

While a majority report positive perceptions, many remain unsure about more advanced or ESP-specific content creation. This points to the need for scaffolded training in both low-tech and high-impact tools.



Bar Chart 3. 8. Comfort with Interactive Content Design

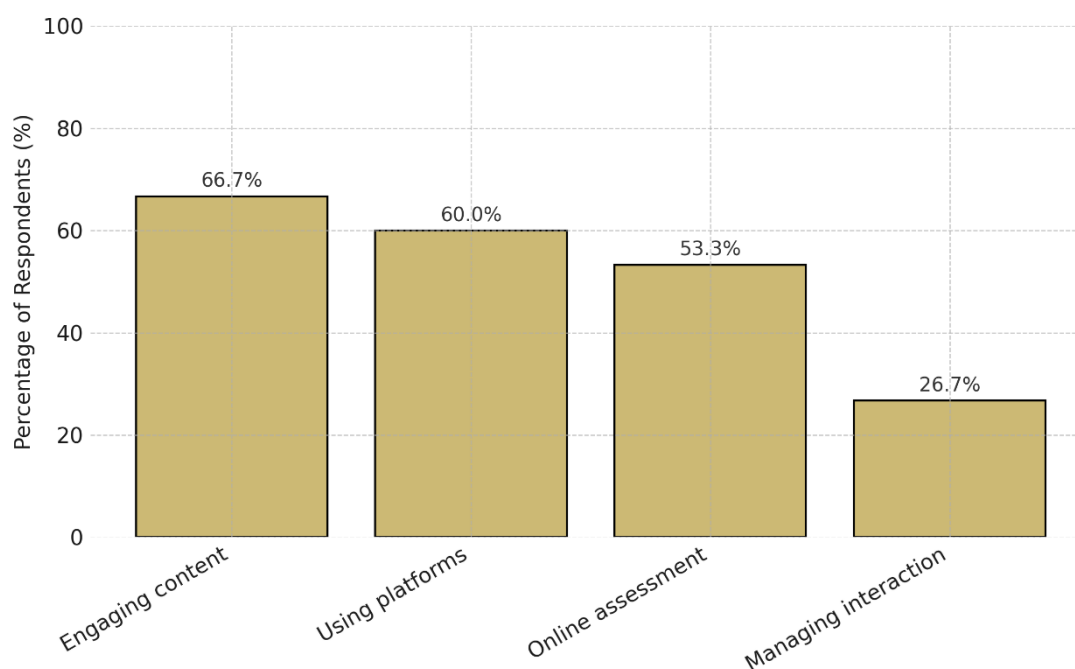
Q13. Which skills do you feel you need to develop most to improve your online teaching?

(Select all that apply)

The teachers highlighted several skill gaps. **66.7% (n=10)** identified a need to develop skills in creating engaging content, followed by **60% (n=9)** for effectively using digital tools, **53.3% (n=8)** for assessing students online, and **26.7% (n=4)** for managing interaction in virtual settings.

This alignment with previous challenges suggests that the teachers not only recognize their limitations but are also self-aware about the specific areas requiring intervention.

Teachers are highly aware of their professional development gaps. Programs should therefore be needs-driven, with clear progression from tool orientation to content creation, digital pedagogy, and learner-centered online practices.



Bar Chart 3. 9. Teachers' Identified Skill Development Needs

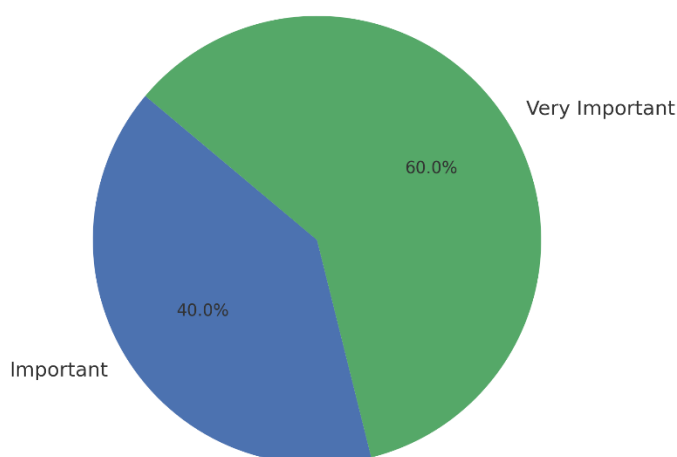
Section 5: Perceptions and Attitudes

Q14: How important do you think online teaching skills are for ESP teachers?

All participants acknowledged the relevance of online teaching skills. **60% (n=9)** rated these skills as important, and **40% (n=6)** as important. No participants indicated a neutral or negative stance.

This widespread consensus reflects how the shift in higher education delivery models post-COVID has affected teacher expectations and priorities.

This shared belief reinforces the relevance of this research and strengthens the argument for institutional investment in continuous digital training for ESP educators.



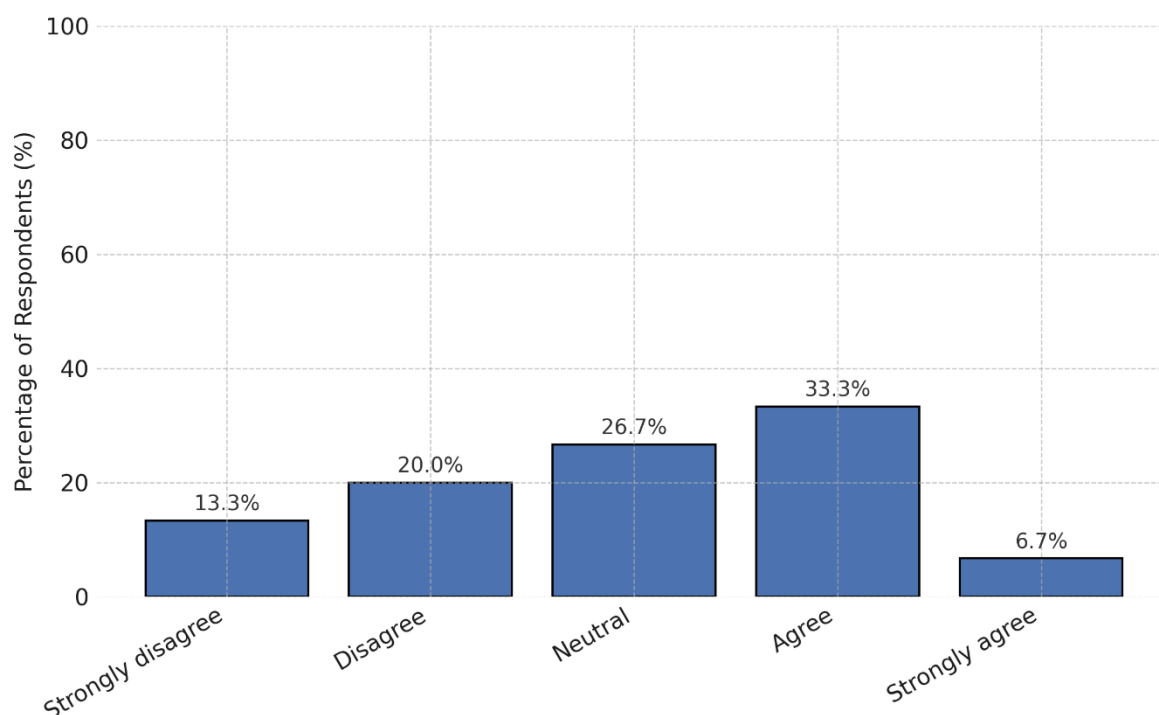
Pie Chart 3. 4. Perceived Importance of Online Teaching Skills

Q15: Do you think online pedagogy can be as effective as face-to-face instruction for ESP courses?

Teachers expressed varied perspectives on this issue. While **33.3% (n=5)** agreed that online instruction could be effective, only **6.7% (n=1)** strongly agreed. A considerable portion—**26.7% (n=4)**—remained neutral, **20% (n=3)** disagreed, and **13.3% (n=2)** strongly disagreed.

These mixed responses reflect an evolving digital culture where skepticism is still prevalent, likely due to a lack of institutional support or exposure to best practices in online ESP teaching.

Attitudes toward online pedagogy are still evolving. Exposure to success stories, reflective teaching models, and evidence-based comparisons will be essential in shifting teacher mindsets and fostering digital confidence.

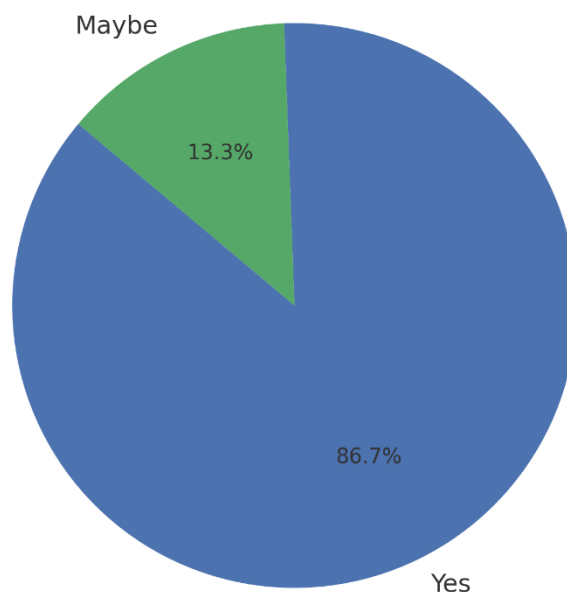


Bar Chart 3. 10. Perceived Effectiveness of Online vs. Face-to-Face Teaching

16: Would you be willing to participate in professional development programs focused on online ESP teaching?

Most respondents—**86.7% (n=13)**—expressed a clear willingness to participate in relevant training programs. The remaining **13.3% (n=2)** were undecided, and none rejected the idea. This indicates a high level of motivation among teachers to address skill gaps and signals an open door for institutions to offer targeted capacity-building programs.

This finding presents an important opportunity for institutions and ministries to invest in demand-driven, well-designed training pathways that meet teachers where they are and lead them toward expertise.



Pie Chart 3. 5. Willingness to Join Online ESP Teacher Training

3.2.1.2. Pre-Training Observation

The pre-training observation phase was designed to establish a baseline of each teacher's instructional practices before the professional development intervention. On January 10, 2024, eight ESP teachers (P1–P8) in Algerian higher education were observed teaching their regular classes, using a structured classroom observation checklist administered by the researcher. The purpose of these initial observations was to document existing teaching behaviors and competencies across key domains relevant to online ESP pedagogy. In particular, the checklist focused on five domains of teacher performance: Lesson Planning, Technological Integration, Pedagogical Strategies, Communication, and Student Engagement. By analyzing trends in these areas, the study aimed to identify common strengths and – more importantly – deficiencies that would inform the subsequent training program. This section

presents a cross-case thematic analysis of the pre-training observation data, emphasizing recurrent shortcomings across the eight teachers, especially those related to ESP-specific teaching practices and readiness for online instruction.

Lesson Planning

Across all observed teachers, lesson planning practices were generally unsystematic and lacked explicit articulation. None of the eight instructors provided a formal written lesson plan or syllabus to guide the observed session (0/8). In practice, teachers tended to rely on the course textbook or a loose mental outline rather than a detailed plan tailored to specific learning objectives. For instance, it was common for a teacher to simply continue from the previous lesson's textbook unit without outlining clear goals for the day's lesson. No teacher explicitly stated the lesson's intended learning outcomes or communicative objectives to the students at the start of class. This absence of stated objectives suggests that the teachers themselves may not have set specific targets for student learning for that session, indicating a lack of deliberate planning.

Another striking finding in this domain was the uniform neglect of ESP-specific objectives in lesson design. 100% of observed teachers failed to incorporate any specialized language or content goals related to their students' target disciplines. Lesson content was largely generic English (e.g., general reading passages and grammar exercises) drawn from standard EFL materials, with no adaptation to reflect the learners' professional fields (such as engineering, medicine, or business contexts relevant to the class). In none of the observed cases did the instructor introduce terminology, genres, or communicative tasks unique to the students' subject area. The planning (to the extent it was evident) did not account for the specific linguistic needs of the learners' specializations, which is a core principle of effective ESP teaching. In essence, teachers were treating the ESP course much like a general English class, omitting the tailored content required for true ESP pedagogy.

Furthermore, there was no indication that any form of needs analysis or learner input had informed the teachers' lesson planning. None of the participants referenced their students' particular professional needs or language skill gaps when choosing lesson content; topics and activities appeared entirely textbook-driven rather than customized to the cohort. This lack of alignment with learners' real-world needs is especially problematic in an ESP context, where course planning should be guided by a prior analysis of learners' target-situation requirements. The absence of a needs-responsive approach at this baseline stage highlights a fundamental deficiency in ESP-specific planning practice across all cases.

Time management and sequencing within lessons also appeared haphazard in several cases, further underscoring planning deficiencies. In the absence of a written plan, several teachers (approximately 50%) struggled with pacing – either rushing through activities without sufficient practice time, or conversely spending too long on minor points and running short on time for more important tasks. For example, in a few classes the instructor lingered on explaining basic vocabulary or grammar rules (perhaps in an attempt to ensure comprehension), only to find there was insufficient time left for the final application or production activity. In other classes, the teacher finished the core material early and resorted to impromptu filler content (such as a loosely related anecdote or simply dismissing the class early), reflecting a lack of planned extension tasks. These issues indicate that half or more of the teachers had not anticipated how to efficiently allocate class time – a skill closely tied to effective lesson planning and one crucial for maintaining momentum in any lesson.

Additionally, none of the teachers provided a structured closure or summary at the end of their lesson. There was no explicit review of key points or reinforcement of the day's learning objectives (unsurprising, given that objectives had not been clearly set or communicated to begin with). Classes typically ended either abruptly when time elapsed or informally when the teacher decided that the material had been “covered,” without any planned

consolidation activity. The absence of a deliberate closing segment meant that opportunities to reflect on or solidify learning were missed in 100% of the observed sessions. This lack of lesson closure further highlights the unstructured nature of the teachers' planning and delivery.

Moreover, no teacher (0/8) demonstrated evidence of lesson planning that incorporated online or technology-enhanced components. Given that the broader aim of the project is improving online pedagogy, it is notable that none of the instructors had planned to use any digital tools or internet-based resources in their lessons. There was no foresight to, for instance, assign an online research task, include a multimedia element, or leverage an educational platform as part of the class plan. This omission underscores a significant gap in preparedness for online teaching modes: in their pre-training state, teachers were not yet considering technology integration as a part of lesson design at all. Their planning routines, insofar as they existed, were confined strictly to traditional in-person teaching methods without any nod to the digital realm.

Overall, the pre-training observations in the Lesson Planning domain reveal a pervasive absence of structured, goal-oriented planning among the participants. Lessons were conducted in a largely reactive manner, following textbook prompts or the instructor's spur-of-the-moment decisions rather than a premeditated blueprint. Crucially, the complete omission of ESP-specific planning elements points to a foundational weakness in aligning lessons with the specialized needs of learners in different professional streams. These baseline findings imply that without intervention, the participating ESP teachers lack the planning competencies necessary for effective specialized instruction and for the more demanding context of online teaching. The training program would therefore need to address basic lesson planning skills – such as setting clear objectives, aligning content with learner needs (via needs analysis), and incorporating technology and interactive elements into the lesson design – in order to build a stronger foundation for subsequent online pedagogy development.

Technological Integration

The observations showed that technology was almost entirely absent from the teachers' instructional practices at baseline. The vast majority of teachers (6 out of 8, or 75%) did not employ any instructional technology whatsoever during their lessons. Their classes were conducted with traditional tools only – typically the whiteboard (or chalkboard), printed textbooks, and oral exposition. These instructors made no use of computers, projectors, audio players, or any other multimedia aids while teaching. The remaining two teachers (25%) displayed only minimal and non-interactive use of technology. For example, one teacher had prepared a set of static PowerPoint slides to project key definitions and exercises (essentially mirroring the textbook content on a screen), and another played a short audio recording from the course's companion CD as a listening exercise. Importantly, even in these two cases, the technology use was rudimentary and teacher-centric: the projected slides and audio were used only to present information, without any interactive or student-controlled elements. No teacher incorporated technology in a way that fundamentally changed the learning activity or gave learners new avenues to participate.

Not a single teacher attempted to integrate the internet or any online resource into the lesson (0/8). There were no instances of teachers using live online content, educational websites, or language-learning apps, nor any use of tools like online quizzes or polls. In other words, the concept of blending online resources or digital interactivity with classroom instruction was entirely absent at this stage. Additionally, none of the instructors utilized a learning management system (LMS) or online platform for class purposes – unsurprising given that these were regular in-person classes, but noteworthy in the context of preparing for online pedagogy. Even simple opportunities to enrich the lesson with technology were overlooked. For instance, an ESP teacher might show a short field-related video or demonstrate an online

dictionary for technical terms; however, no such enhancements were observed in any class. The teachers stuck exclusively to print and face-to-face modes of delivery.

The lack of technology integration extended to student activities as well. No teacher encouraged or required students to use any kind of device or digital tool during the lesson. Students were not asked to conduct quick online research, use their smartphones for a learning task, or engage with content on a computer. All student work remained pen-and-paper (completing worksheets, reading printed texts, writing answers in notebooks) or oral exchanges with the teacher. This suggests that, at baseline, teachers did not consider student-centered technology use as part of their pedagogy. It was not simply that teachers themselves avoided using tech; they also did not prompt learners to leverage technology in any way, even for tasks that could have been enhanced by digital resources (such as looking up specialized vocabulary online or collaborating via a shared document).

A deeper look at this domain highlights that teachers were not leveraging technology even where it could particularly benefit ESP instruction. In ESP courses, targeted use of technology can provide access to authentic materials and specialized tools – for example, online technical dictionaries, simulators, corpora or databases specific to the discipline, or communication platforms to practice professional skills. Yet none of the observed teachers utilized any discipline-specific digital resources. For instance, the teachers of scientific or technical English did not show real-world videos or software from those fields, and the teacher of Business English did not use any online business case or email simulation. The absence of such ESP-tailored technology use underscores a common deficiency: teachers were not connecting language instruction with the rich digital content available in the students' professional domains. This was a missed opportunity to bring relevance and authenticity to their teaching, and it further illustrates the gap in their readiness to teach ESP in an online environment (where such resources could be easily incorporated).

It is also telling that even when basic technological tools were available in the classroom, they went largely unused. Some classrooms were reportedly equipped with a data projector and computer station, yet most teachers did not take advantage of them. There were no reports of technical malfunctions or lack of access during the observations; rather, it appears the instructors chose not to engage with the available technology. This points to issues of either confidence or habit – the teachers possibly lacked the confidence to use technology smoothly, or simply were not in the habit of planning and delivering tech-enhanced lessons. One observed teacher, for example, hesitated noticeably when operating the audio player and needed a moment to get it working, hinting at unfamiliarity. Others avoided any tech, perhaps out of concern that it might disrupt the flow of their lecture. In short, a passive attitude toward classroom technology prevailed.

The baseline status of technological integration among the observed ESP teachers was one of near-zero utilization. They did not demonstrate the digital competencies or mindset expected of instructors who are preparing to move into online teaching. The complete avoidance of online tools and minimal use of even offline educational technology indicate a significant preparatory gap. If these teachers were to transition to online ESP instruction immediately, they would face steep challenges in using digital platforms, multimedia content, and interactive tools essential for engaging online learners. The pre-training observation makes it abundantly clear that a critical component of the forthcoming professional development must be to build teachers' skills and comfort in integrating technology into their teaching. They will need exposure to effective strategies for using general educational technology as well as training in ESP-specific digital resources, so that technology becomes a natural and meaningful part of their pedagogical repertoire going forward.

Pedagogical Strategies

The pedagogical approaches employed by the ESP teachers were overwhelmingly traditional and teacher-centered. All eight instructors primarily relied on lecture-style delivery or teacher-led explanation throughout the lesson, with students playing a largely passive role. There were no instances of collaborative learning activities such as group work or pair work in any of the observed classes (0/8). Likewise, no teacher organized interactive problem-solving tasks or projects. Instead, the typical pattern was that the teacher would talk or explain a concept, and students would listen or take notes, followed by the students quietly working on an individual task (e.g., reading a text or completing an exercise from the textbook) and then the teacher checking answers with the whole class. This teacher-dominated routine was consistent across all cases, indicating that student-centered pedagogy was effectively absent at the baseline observation stage.

A closer look at classroom activities underscores the lack of variety and interaction. Most lessons were built around the textbook exercises: for example, teachers often had students read a passage silently or out loud and then answer comprehension questions or fill-in-the-blank grammar items. The teacher would then solicit answers, usually from volunteers or by calling on individuals, and evaluate them on the spot. This cycle of lecture → individual seatwork → teacher evaluation was observed in every class. Such a format leaves little room for open discussion, creative language use, or learner initiative. Indeed, across the eight observations, none of the teachers incorporated any open-ended communicative activity where students could converse freely or collaborate (such as debates, role-plays, or group problem-solving tasks). The pedagogy was uniformly focused on controlled practice of language points and on teacher-led review of those exercises. While this approach can reinforce specific linguistic items, it falls short of fostering the kind of interactive learning that is often crucial for engagement and skill development, especially in online settings.

Notably, pedagogical strategies specific to ESP were missing. An effective ESP approach would typically involve tasks that simulate real-life communicative situations from the students' target domains (for instance, a business negotiation role-play for Business English students, or analyzing a case study for engineering students). However, no such authentic or contextualized tasks were observed. In 100% of the lessons, activities remained generic (e.g., general-topic readings, common grammar drills) and did not explicitly link to the students' future professional contexts. For example, the teachers did not ask students to produce any discipline-specific writing or speaking outputs – such as drafting an email related to their field or presenting on a technical topic – nor did they engage students in understanding genre conventions of their discipline (like scientific report structure or legal English phrasing). In essence, the pedagogical strategies were indistinguishable from those of a general EFL class, showing no adaptation to the “specific purposes” element of ESP. This common deficiency suggests that the teachers either were not equipped with ESP-tailored methods or did not recognize the need to depart from the general English pedagogy they were familiar with.

Another aspect of the observed methodology was an emphasis on translation and form-focused instruction, which further highlights the traditional bent of these teachers. Several instructors (at least 50%) were noted to frequently translate vocabulary or instructions into the students' L1 (Arabic or French) rather than encouraging students to infer meaning through context or explain in English. For instance, when confronted with a technical term in a reading, the teacher would often supply the Arabic equivalent on the board. Likewise, explanations of grammar or usage were sometimes delivered in the native language to ensure comprehension. This reliance on translation aligns with a grammar-translation style approach and indicates a comfort zone in teacher exposition rather than facilitating student discovery or discussion in English. It also reflects a potential lack of confidence either in the students' ability to grasp content in English or in the teacher's own ability to convey complex ideas simply in the target

language. While judicious use of L1 can be helpful, the extent observed here meant less practice for students in formulating ideas in English. Moreover, a focus on accuracy and form was prevalent: teachers spent significant time explaining grammar rules or correcting errors during answer checks, but did not extend those points into communicative practice. For example, if a student made a mistake in an exercise, the teacher would correct it (sometimes explicitly talking about the rule) but would not then have the student use the corrected form in a meaningful context – the lesson would move on once the right answer was given.

Differentiation or adaptation of pedagogy to student levels was also absent across the cases. All students in a class were treated uniformly in terms of task difficulty and pace, with no modification observed for varying proficiency or background knowledge. Teachers taught to the whole class as a single unit, which likely means that stronger students were not especially challenged and weaker students were not given additional support beyond what the teacher provided to everyone. For instance, during individual work, teachers did circulate to monitor in a few cases, but their monitoring typically involved either a quick glance or answering individual queries from students who asked for help; there was no structured support like providing easier sub-tasks to those struggling or extension tasks to those who finished early. Similarly, no scaffolding strategies were evident in the lesson structure – teachers did not build activities in progressive complexity that would scaffold learners into more complex skills. Instead, each lesson tended to focus on a narrow set of language points practiced in isolation. This one-size-fits-all, atomistic approach is another indication of traditional pedagogy and contrasts with contemporary learner-centered strategies that adjust to learners' needs.

Crucially, none of the pedagogical techniques observed would readily translate to an online teaching environment without significant adaptation. The heavy reliance on teacher monologue and penned exercises, for instance, could become even more static and disengaging if replicated in a virtual classroom. In an online setting, best practices often involve interactive

elements, frequent changes of activity, and collaborative work to keep learners engaged remotely. Yet the teachers showed no use of methods like interactive polling, breakout group tasks, or student-led presentations – strategies that are known to be effective online. Their current pedagogical repertoire, as observed, did not include any explicit preparation for or simulation of online teaching methodologies. For example, none had students engage in any form of asynchronous preparation (such as reading or researching before class) that could mirror a flipped classroom model, nor did they utilize class time for activities that take advantage of in-person presence in ways that online would differ. This indicates that the teachers were not yet thinking in terms of the pedagogical shifts needed for online instruction.

In sum, the Pedagogical Strategies domain at pre-training reveals a cohort of teachers adhering to a conventional, instructor-focused mode of teaching, with minimal interactivity and no ESP customization. The common deficiencies – lack of collaborative learning, absence of authentic ESP tasks, over-reliance on translation, and failure to differentiate – all point to a baseline scenario where teaching is driven by habit and convenience rather than contemporary best practices. For these teachers to become effective online ESP instructors, they will need to significantly broaden and update their pedagogical toolkit. The training should encourage them to adopt more learner-centered and task-based approaches, incorporate authentic materials and scenarios from students' fields, and practice interactive techniques that engage learners – whether in person or online. Addressing these gaps is critical, as the current strategies are ill-suited to exploit the potential of online platforms or to meet the specific learning outcomes of ESP courses.

Communication

Classroom communication patterns during the pre-training observations were largely one-sided and did not foster meaningful student interaction. In every observed class, teacher talk dominated the discourse, accounting for the vast majority of speaking time (anecdotal

estimates by the observer suggest well above 80% teacher talk in all cases). Teachers spent a great deal of time lecturing, explaining, or reading aloud, whereas student talk was mostly limited to brief responses to the teacher's questions. The typical interaction followed an Initiation-Response-Feedback sequence: the teacher initiated with a question or prompt, one student responded (often just a few words or a sentence), and the teacher immediately evaluated or commented on that response before moving on. There were no extended exchanges or dialogues beyond this pattern. For instance, if a student answered a question correctly, the teacher would say "Correct" and then proceed to ask another question or continue the lecture; if the answer was incorrect or incomplete, the teacher would supply the right answer or clarify the point quickly. At no point did any teacher encourage students to elaborate on their answers or engage in a back-and-forth discussion. This IRF recitation style was observed in 100% of the classes, underscoring a teacher-controlled communication mode rather than an open communicative environment.

The questioning techniques employed by the teachers further reflected a limited communicative approach. Most questions posed were closed-ended or display questions – that is, questions to which the teacher already knew the answer and that often checked comprehension of the material (e.g., "What does this word mean?" or "Is the statement true or false?"). Across all eight sessions, none of the teachers was observed asking open-ended questions that invite opinion, analysis, or creative language use. For example, teachers did not ask things like "Why do you think this concept is important in your field?" or "Can you suggest an example from your specialty?". Instead, questions were narrowly focused on the textbook content and usually had one correct answer. This approach tests students' recall or understanding but does not stimulate discussion. It also places students in a passive role – responding only when asked and only to fetch known answers – rather than prompting them to express ideas in English at length. Consequently, student contributions were minimal and

purely reactive, with no spontaneous student-to-student communication observed. Not a single instance occurred of students initiating a discussion or building on each other's points; all communication flowed through the teacher as the hub.

Feedback and error correction practices in these classes were uniform but limited in pedagogical value. All teachers gave feedback in the form of brief evaluative comments. If a student answered correctly, the teacher typically provided a short affirmation ("yes, right" or a nod) and immediately moved on. If a student made an error, the teacher would either correct it directly ("No – the correct answer is X") or occasionally ask another student to answer. However, none of the teachers engaged in elicitative feedback or gentle prompting to let students self-correct; nor did they use errors as an opportunity for deeper explanation or group learning. For instance, a teacher might simply supply the correct form of a mispronounced word, but would not then get the student to repeat it or discuss the mistake. Similarly, when a content question was answered incorrectly, teachers did not delve into why the student answered as they did or explain the underlying concept again – they simply provided the right answer and proceeded. Praise or positive reinforcement was also sparse beyond acknowledging correct answers; teachers seldom expanded on student responses to say why it was good or link it to the lesson context. In essence, feedback was binary (correct/incorrect) and focused on accuracy of responses, without nurturing a more supportive dialogue that could encourage students to speak more or think critically. This feedback style, while keeping the lesson on track, may not build students' confidence or communicative competence, and it reflects a view of communication as a means to convey information rather than to develop skills through interaction.

Student-initiated communication was virtually nonexistent in the observed classes. In none of the sessions did students freely ask questions or volunteer comments beyond the structured Q&A led by the teacher. The classroom atmosphere, perhaps due to the teacher-

centered style, did not invite learners to voice doubts or curiosities spontaneously. Only very rarely (in perhaps one or two instances across all eight classes) did a student interrupt to seek clarification on a point, and even those instances were quickly resolved by the teacher without opening the floor for further student questions. It appeared that students were accustomed to waiting for the teacher to give them turns to speak. Teachers, for their part, did not explicitly encourage questions like “Do you have any questions about this?” or if they did, it was a perfunctory rhetorical question that did not yield responses. This indicates a one-way transmission model of communication: teachers delivered content and managed dialogue strictly on their terms, while students spoke only when called upon. The lack of a questioning culture or open discussion means that potential opportunities to address student confusion or explore topics in more depth were missed. In an online class, where students might be even more reticent to speak up, such an absence of student-initiated communication could be even more problematic.

Language use in the classroom was another facet of the communication domain, and here the observations noted a significant amount of code-switching by some teachers. Roughly half of the teachers (4 out of 8) intermittently switched to the students’ first language (Arabic, or in some cases French) during the lesson. This usually occurred when explaining difficult concepts, giving complex instructions for an activity, or translating specific technical terms. For example, one teacher teaching an ESP class for science students would explain an English term in Arabic to ensure the students recognized it in their field context. Another teacher summarized a reading passage’s main idea in French before asking students to answer detailed questions in English. The remaining teachers conducted their lessons predominantly in English, only resorting to the L1 for brief moments (if at all).

The use of L1 seemed motivated by a desire to guarantee comprehension and perhaps to save time – instead of trying to simplify English further or elicit understanding through

examples, these teachers found it quicker to translate or clarify in the native language. While this approach can be practical, it also reduces students' exposure to English discourse and the necessity to negotiate meaning in English. It may also signal that teachers are unsure about how to make input comprehensible in English-only ways (a skill especially needed online, where checking understanding is harder). In the observed sessions, whenever code-switching happened, it was the teacher who switched; students typically answered in English (often with single words or short phrases), unless invited by the teacher to explain something in L1. Thus, L1 was used as a scaffold by teachers, but the risk is that it became a crutch, potentially limiting the development of students' ability to function in English.

The overall rapport and communicative climate of the classes could be characterized as formal and academically oriented, rather than interactive or personable. Teachers always maintained control of turn-taking and topic selection. There was little to no off-topic or informal interaction – for instance, teachers did not begin with small talk, anecdotes, or attempts to connect with students' personal experiences. Communication was confined to the lesson content. Additionally, teachers typically addressed the class as a whole or in impersonal terms ("Anyone know the answer? No? Okay, it's...") rather than using many individual names or fostering inclusive dialogue. This is not to say the atmosphere was hostile; rather, it was business-like and somewhat impersonal, which can be common in university settings. However, this meant that communication did not particularly serve to motivate or engage students beyond the cognitive level. In a fully online environment, where building a sense of community and personal connection can be vital to keep students engaged, such a reserved communication style might prove insufficient.

The Communication domain observations reveal that the teachers were functioning mostly as lecturers or knowledge providers, with students cast in a responsive role. The interactions were controlled, brief, and focused on correctness, offering students few chances

to practice extended communication in English. This teacher-centric communication pattern is a notable deficiency in terms of preparing for online ESP teaching. Effective online pedagogy requires clear, engaging communication skills: instructors must give crystal-clear instructions (since online students might not immediately ask for clarification), check understanding frequently in creative ways, stimulate discussion in virtual forums, and encourage students to communicate despite the distance.

None of these skills were evident in the baseline observations. The teachers will need guidance on how to shift from a monologic style to a more dialogic one – encouraging student contributions, handling open discussions, providing richer feedback – and how to do so in English within an ESP context. Moreover, they should learn strategies to simulate the kind of communicative practice that ESP learners need (e.g., role-playing professional communication scenarios), which were entirely missing here. Addressing these communication strategy gaps is essential, as they underpin student engagement and learning both in face-to-face and online classrooms.

Student Engagement

Student engagement during the pre-training observations was generally low and superficial, mirroring the teacher-led dynamic of the classes. In all eight cases, the majority of students were passive for most of the lesson, appearing to merely follow along with the teacher's exposition or the textbook activity without active participation. When the teacher posed questions, usually only a small subset of the class responded or raised hands (often the same few confident students each time). Many other students stayed quiet unless directly called on, and even then their answers were terse. None of the observed lessons featured sustained interactive engagement where most students were simultaneously involved (e.g., through group debate, collaborative problem-solving, or hands-on projects). Instead, engagement was typically one-on-one between the teacher and an individual student while the rest of the class

watched. As a result, at any given time, a significant portion of the class was not actively contributing, which suggests that their cognitive engagement might have been limited to listening or taking notes. The overall impression from observers was of classes where attention and participation were uneven: a core of students interacted when asked, and the rest remained in the background.

Qualitative signs of disengagement were noted in several classes. For instance, in multiple sessions students were observed diverting their attention – a few students in the back rows were seen checking their mobile phones under the desk or whispering to neighbors about non-class matters when the lesson failed to capture their interest. In one class, the observer reported that towards the second half of the period, at least a third of the students looked visibly disinterested (avoiding eye contact with the teacher, slumping in their seats). While such behavior can have many causes (tiredness, etc.), the fact that it was common across different teachers' classrooms points to a systemic issue in maintaining engagement.

Importantly, when these lapses in student attention occurred, teachers did not effectively address them. None of the teachers employed strategies to re-energize or re-focus the group. In a few cases, a teacher admonished the class generally ("Pay attention, please") upon noticing waning attention, or prompted a specific off-task student by calling their name to answer a question. However, these were momentary fixes and did not lead to any change in the lesson approach. There were no attempts to incorporate a quick energizer activity, a change of pace, or an interactive prompt to recapture everyone's attention. This suggests that the teachers lacked a toolkit for diagnosing and remedying engagement problems in real time – a crucial skill, especially in an online context where disengagement (often invisible) can be even more pronounced.

A key reason for the low engagement was the lack of interactive or student-centered activities, as previously described. Because students were never tasked with working together

or taking charge of an activity, they had few opportunities to become deeply involved. For example, no group discussions or problem-solving tasks were given that might have drawn in quieter students. In traditional settings, even a simple “turn and talk to your neighbour about this question” can momentarily boost engagement by giving every student a chance to speak; none of the teachers used such techniques.

Likewise, no student presentations or role-plays were assigned, which could have assigned responsibility and active roles to learners. With the pedagogical format constrained to teacher-led Q&A and individual work, it is unsurprising that engagement remained low – students were mostly in listening mode. Furthermore, the content being taught was not made inherently engaging or relevant from the learners’ perspective. As noted in other domains, the lessons did not explicitly connect to the students’ field of study in a way that might spark enthusiasm. For instance, an ESP teacher could increase engagement by pointing out how a language skill will help in the students’ future workplace or by bringing in an interesting real-world example from their field. Such motivational framing was absent. Consequently, some students likely failed to see the immediate relevance of what they were learning, which can dampen intrinsic motivation.

The observations also suggest that teachers were not proactively monitoring and cultivating engagement. A skilled instructor often “reads the room” and notices who has not participated or who seems confused, and then deliberately brings those students into the activity. In these baseline classes, however, participation was largely voluntary or driven by the teacher’s closed questioning. Teachers did not systematically try to include each student. For example, with classes of perhaps 20–30 students, often only 4 or 5 individuals might speak during the entire lesson. The teachers did not, say, go around the room at any point or use random selection techniques to ensure broad involvement. Nor did they use any formative assessments (like a quick quiz or a show of hands) that could both engage students and give

feedback on their understanding. There was a general lack of interaction between teacher and individual students beyond those who self-selected to respond. This indicates that at baseline, these teachers might equate “covering the material” with accomplishing the lesson, without fully considering the level of student mental involvement in that process. In an online scenario, such an approach could be even more problematic, as students can easily become invisible or completely passive (for instance, by muting themselves and disengaging), and a teacher must employ deliberate tactics to keep everyone involved.

Another dimension of engagement is whether students feel encouraged to take initiative or ownership of their learning, and pre-training data suggest this was not the case. None of the observed teachers created opportunities for students to make choices in the lesson or contribute ideas beyond answering the teacher’s questions. For example, no teacher asked students to brainstorm or come up with examples, which could have made them more active participants. The notion of student autonomy – having students lead part of an activity, explain something to peers, or reflect on their learning – was entirely absent. The classroom culture leaned toward students complying with teacher directives and completing required tasks, rather than students engaging out of interest or curiosity. When assignments were given (like reading a text or doing exercises), students did them quietly, but there was little enthusiasm noted. In a couple of classes, once the teacher signaled that an exercise was done and moved on, some students who hadn’t finished simply stopped working rather than trying to catch up or ask for more time – implying that their engagement with the task was only as strong as the external structure imposed by the teacher.

Overall, the pre-training observations paint a picture of consistently low student engagement. From a quantitative standpoint, one could say 0% of classes achieved high-engagement techniques that got all or most students actively involved; and qualitatively, there were frequent signs of disengagement that went unaddressed. This baseline is a cause for

concern regarding the teachers' preparedness for online ESP teaching. Engaging students is often one of the greatest challenges in online education, where distractions are plentiful and the instructor cannot physically oversee the room. If these teachers struggled to engage learners in person – with several essentially “tuning out” during class – they are likely to face even greater difficulties in a virtual classroom unless they adopt new strategies. The findings underscore the need for the training program to prioritize student engagement techniques: for example, training in interactive activity design, motivation strategies (especially tying ESP content to students' personal and professional goals), use of questioning that promotes thinking, and methods to monitor and prompt participation in an online platform (such as using chat features, breakout discussions, or virtual polls to keep students active). By addressing these areas, the teachers can learn to transform their classes from passive to active learning environments.

Reflective Conclusion

The pre-training observation findings reveal that, at baseline, the participating Algerian ESP teachers were ill-prepared for the demands of online pedagogy. Across all five domains, a pattern of traditional, non-specialized, and low-engagement teaching practices was evident. Teachers lacked systematic lesson planning and did not tailor content to ESP needs, they showed almost no integration of technology, their pedagogical methods were teacher-centered and void of interactive or field-specific tasks, their communication style limited student involvement, and their classes yielded minimal student engagement. In essence, these educators were teaching in a mode that might be described as “business-as-usual” for general EFL in a developing context – a mode characterized by lecture, textbook exercises, and teacher-led talk – which falls far short of what is required for effective online ESP instruction.

The baseline observations highlight critical gaps: the teachers have not yet developed the competencies to design learner-centered, ESP-targeted activities, nor the digital literacy

and interactive communication skills needed to facilitate learning in a virtual environment. This starting point underscores both the challenge and the importance of the professional development intervention. It confirms that without substantial upskilling, simply moving these teachers to an online platform would likely replicate and even exacerbate the current shortcomings (for example, an online class with no interaction or technology use would be even more disengaging than the face-to-face classes observed). On a positive note, the clarity of these pre-training deficiencies provides a roadmap for the training program: it must focus on fostering fundamental changes in teachers' approaches to planning, technology use, pedagogy, classroom communication, and student engagement. In summary, the pre-training phase has revealed a low baseline of online-teaching readiness among Algerian ESP teachers, validating the need for a targeted intervention and setting the stage for measuring growth as the teachers undergo training and eventually implement new strategies.

3.2.2. The Training Phase Results

Following the identification of key gaps during the pre-training phase, a targeted professional development program was implemented to address the specific needs of ESP teachers in relation to online pedagogy. This training was designed and delivered by the researcher in collaboration with Mr. Akram Serdani, an expert in online instruction and digital education tools.

The training program spanned a period of six weeks, with sessions held every Saturday for two hours. This format allowed for continuous engagement while accommodating the teachers' existing academic responsibilities. The weekly sessions provided a structured yet flexible approach to professional development, promoting gradual learning, reflection, and practical application.

Each training session focused on a key component of online ESP instruction, covering areas such as the integration of educational technology, learner engagement in virtual settings, online content adaptation, and digital assessment strategies. The training was underpinned by the Technological Pedagogical Content Knowledge (TPACK) framework, which guided the balance between subject-specific content, pedagogical approaches, and appropriate use of digital tools.

Participants were actively engaged through a variety of interactive activities, including demonstrations, guided practice, collaborative discussions, and microteaching simulations. Tools such as Google Classroom, Padlet, Zoom breakout rooms, and H5P were introduced and explored in context, enabling participants to gain both technical skills and pedagogical strategies relevant to the ESP classroom.

In addition to the live sessions, participants were provided with a digital instructional guide, co-developed by the facilitators, to reinforce the key concepts and serve as an ongoing reference for their professional use. Teachers were also encouraged to reflect on their own practices and adapt the training content to their specific teaching contexts.

The mid-point feedback indicated a high level of satisfaction with the training structure and content, particularly the focus on practical tools and the contextualization of examples to the Algerian higher education environment. The final sessions involved the development and peer review of online ESP lesson plans, which allowed teachers to demonstrate their newly acquired skills and receive constructive feedback.

Overall, the training phase contributed to a measurable enhancement in participants' digital competencies, confidence in online delivery, and ability to implement learner-centered practices in virtual ESP instruction. The collaborative facilitation model, with contributions from both the researcher and Mr. Serdani, fostered a supportive professional learning community and provided a sustainable model for future ESP teacher development in Algeria.

3.2.3. The Post-Training Phase Results

Following the completion of the training program, further data were collected to evaluate its impact on ESP teaching practices. This phase encompassed two key components: (1) structured classroom observations of participants P1–P8 after the training (compared against their pre-training baseline), and (2) a post-training feedback questionnaire. The results are presented in two subsections. Section 4.2.3.1 reports on cross-case **post-training observation results**, highlighting thematic transformations in lesson planning, technology use, pedagogy, communication, and student engagement. Section 4.2.3.2 presents an analysis of **post-training feedback**, detailing common themes in teacher reflections such as increased confidence with digital tools, shifts toward learner-centered pedagogy, perceived training relevance, and suggestions for future development. The findings are discussed with reference to the TPACK model, reflective practice, and the objectives of both the professional development program and national educational reforms.

3.2.3.1. Post-Training Observation Results

To gauge tangible changes in classroom practice, each participant (P1–P8) was observed teaching an ESP class post-training using the same structured observation checklist employed before the training. A comparative, cross-case thematic analysis of the pre- and post-training observations reveals marked improvements across several pedagogical domains. Notably, qualitative transformations were evident in (a) lesson planning aligned to field-specific needs, (b) integration of educational technology, (c) use of student-centered and ESP-relevant pedagogical strategies, (d) classroom communication and interaction patterns, and (e) overall student engagement levels. Table 4.2.3.1 below summarizes these key changes, contrasting the general pre-training and post-training observation outcomes for each aspect.

Aspect	Pre-Training Observation (Common Baseline)	Post-Training Observation (Notable Changes)
Lesson Planning (Field-Specific Alignment)	Lesson plans showed minimal tailoring to learners' specific fields; most teachers relied on generic ESL content with little adaptation to ESP contexts.	Plans demonstrated stronger alignment with field-specific needs for nearly all participants. For example, several teachers incorporated industry-specific vocabulary, case studies, and examples (e.g., engineering terminology, business case scenarios), reflecting a clearer focus on learners' professional domains.
Technological Integration (Use of Digital Tools)	Very limited educational technology use was noted. Few teachers went beyond basic PowerPoint slides or PDFs; interactive tools were rarely observed (e.g., 0 instances of breakout rooms, only 1 teacher attempted a collaborative Google Doc activity in pre-observations).	There was a considerable increase in purposeful tech integration. All teachers leveraged at least one new digital tool learned from the training. For instance, 6 out of 8 participants utilized breakout rooms to facilitate small-group tasks, and about 5 incorporated collaborative platforms like Padlet or Google Docs for student

		activities. This indicates a proactive adoption of technology to enhance interactivity.
Pedagogical Strategies (Scaffolding, ESP Tasks, Student-Centered Learning)	Predominantly teacher-centered approaches were observed. Lecturing and rote exercises prevailed, with few scaffolded activities. Tasks often lacked authentic ESP context (e.g., exercises were generic or not obviously relevant to students' specialty).	A pedagogical shift toward student-centered methods was evident. All teachers implemented some form of scaffolding and staged activities to support learning (e.g., step-by-step tasks building up to a complex project). Many lessons featured authentic ESP materials and tasks – for example, role-plays and case studies directly drawn from the students' target professional contexts (medicine, engineering, etc.), enhancing relevance and engagement.
Communication & Interaction (Teacher-Student Rapport and	Classroom interaction was mostly one-directional. Teachers dominated talk time and relied on traditional Q&A, with limited peer-to-peer communication. Little emphasis on building rapport or interactive	Improved rapport and interactive communication were observed post-training. Teachers fostered a warmer classroom atmosphere and encouraged dialogue. In about 5 of the classes,

Peer Interaction)	discussion was recorded in the pre-training phase (e.g., interactions were often formal and initiated solely by the teacher).	participants explicitly facilitated peer discussion (e.g., having students discuss in pairs or groups via breakout rooms or in-class activities). Teachers were also seen using open-ended questions and positive feedback to invite student contributions, indicating a shift towards a more communicative and collaborative classroom dynamic.
Student Engagement (Active Participation and Real-Time Feedback)	Student engagement was generally low to moderate. In the pre-training observations, many students remained passive, as lessons provided few opportunities for active participation or initiative. Real-time feedback from teachers was sparse; assessment tended to be summative or postponed (e.g., only at the end of an activity or lesson).	Higher student engagement was evident in all post-training classes. Teachers incorporated participatory tasks such as group problem-solving, project work, and live polls/quizzes, which visibly increased student involvement (students were on-task and contributing ideas throughout the lesson). Teachers also provided more immediate feedback and formative guidance during activities. For example,

		observers noted instances of teachers circulating (in-person or virtually) to check on group work progress and offering quick, targeted feedback or hints, thereby keeping students actively on track.
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Table 3. 2. Summary of Pre- and Post-Training Observation Outcomes Across Key Teaching Aspects (P1–P8)

These qualitative improvements illustrate that the training intervention had a substantial positive effect on the participants’ teaching practices. The following excerpts from the observation notes provide illustrative evidence of the transformations:

Lesson Planning & Authenticity: In the post-training observation for P3, “the lesson content was tailored to the learners’ field of study (biology); the teacher introduced a lab scenario requiring students to use discipline-specific terminology, a marked change from the generic content observed pre-training.” This reflects a newfound emphasis on aligning instruction with field-specific learner needs, an outcome directly tied to one of the program’s objectives of enhancing ESP relevance in lesson design.

Use of Technology: Prior to training, none of the teachers utilized breakout rooms or interactive boards in their online lessons. After training, multiple cases demonstrated change. For example, “P5 divided students into breakout rooms to collaboratively analyze a case study on engineering ethics, with groups documenting their ideas on a shared Google Doc.” (Post-observation, P5). This practice was absent in P5’s pre-training session but became a highlight

of their post-training pedagogy, indicating not only increased technological integration but also a shift toward collaborative learning structures. Likewise, P7 was observed using Padlet as a live brainstorming wall, where students posted answers to an ESP problem scenario in real time – a technique that engaged the whole class and was noted as a new addition compared to P7's teacher-centric pre-training lesson.

Pedagogical Strategies: Across cases, observers reported a clear adoption of more scaffolded and student-centered activities. For instance, “in P2's post-training class, the teacher sequenced tasks effectively: beginning with a simple review quiz on medical terms, then a guided reading of a hospital case report, and finally a student-led role play of a doctor-patient interaction.” This scaffolding approach was not present in P2's earlier teaching. Such practices demonstrate the participants' conceptual internalization of training content on how to gradually build students' skills and confidence (a core principle in effective ESP pedagogy). Moreover, tasks now bore greater authenticity – several teachers introduced simulations or project-based tasks mirroring real-world uses of English in the students' professional fields, thereby enhancing the ESP authenticity of their classes.

Communication and Interaction: An observable improvement in classroom atmosphere and communication patterns was noted post-training. Teachers made deliberate efforts to establish rapport and facilitate peer interaction. For example, “P8 began the lesson with a brief informal chat, connecting with students about their week in the context of their field, which noticeably relaxed the learners.” Such rapport-building was rarely seen pre-training. Additionally, “P4 encouraged students to give feedback on each other's mini-presentations, prompting polite peer critique and discussion,” whereas previously P4 had conducted lessons as one-way lectures. These changes point to a pedagogical shift toward viewing communication as a two-way process and valuing student voices in the ESP classroom.

Student Engagement and Feedback: The post-training observations consistently describe students as more actively engaged. In all cases, the introduction of interactive tasks and real-time feedback mechanisms kept students involved. For example, “during P1’s session, students worked in teams on a problem-solving task relevant to their specialty (IT), and the teacher moved between groups (in breakout rooms) offering instant feedback and probing questions.” Students were reportedly “on task and enthusiastic,” a stark contrast to the passive note-taking witnessed in P1’s pre-training class. The use of real-time formative feedback – a practice emphasized during the training helped in sustaining engagement and ensuring students understood the material throughout the lesson, not just at the end.

These post-training observational outcomes strongly align with the goals of the professional development program. Teachers not only implemented the techniques and strategies introduced during training, but in many cases they adapted and integrated them into their unique ESP contexts. From a TPACK perspective, the participants demonstrated growth in combining their technological, pedagogical, and content knowledge. For instance, the ability to thoughtfully incorporate tools like Padlet or Google Docs into field-specific lessons indicates an enriched Technological Pedagogical Content Knowledge: teachers learned to intentionally blend subject matter, instructional best practices, and technology to maximize student learning. In other words, they moved beyond using technology for its own sake and instead used it to support pedagogy and content goals – precisely the kind of synergy that the TPACK model advocates. This improved harmony between technology use and pedagogical strategy suggests that the training successfully enhanced teachers’ capacity to design ESP instruction at the intersection of these knowledge domains (content, pedagogy, and technology). Moreover, the qualitative shifts observed – greater authenticity in materials, more collaborative activities, improved student engagement – indicate a conceptual internalization of learner-centered teaching principles. The teachers did not merely follow a checklist of new techniques; rather,

their post-training practices suggest they had embraced a pedagogical shift toward more interactive, needs-driven teaching. This outcome is significant as it meets the professional development program's objectives of fostering student-centered, technology-enhanced ESP pedagogy. It also reflects positively on broader educational goals: teachers are now teaching in ways that are more likely to develop learners' communicative competence and engagement, which is a core aim in modern language education reform. In summary, the post-training observation results provide compelling evidence of teacher development in action – teachers translating training content into improved instructional practice – thereby validating the efficacy of the training intervention.

3.2.3.2. The Post-Training Feedback

Originally, it was planned to complement the post-training observation results with in-depth semi-structured interviews to gain a deeper understanding of teachers' reflective experiences and pedagogical transformations. However, due to unforeseen scheduling constraints, this component had to be omitted. The majority of the participating teachers were Master's students actively preparing for the national PhD entrance examinations, which significantly limited their availability during the post-training period. Consequently, the feedback was collected solely through a structured Google Forms questionnaire, which provided valuable yet more concise insights into their post-training perceptions and experiences.

The post-training feedback questionnaire (administered via Google Forms) was used to capture the teachers' self-reported experiences and perceptions after completing the training. All eight participants (P1–P8) responded to the questionnaire, which combined Likert-scale items and open-ended questions. The responses were analyzed using thematic coding to extract common themes and insights. The qualitative feedback from the teachers offers a reflective

complement to the observational data, revealing how participants internalized the professional development experience and how they envision their future practice. Four dominant themes emerged from the analysis: (1) increased confidence in using digital tools, (2) a shift toward learner-centered pedagogy, (3) perceived relevance of the training to ESP classroom realities, and (4) suggestions for more advanced or continuous training. Each theme is discussed below, supported by representative excerpts from the teachers' feedback.

Increased Confidence in Using Digital Tools: A unanimous theme in the feedback was the boost in teachers' confidence and self-efficacy with educational technology. All participants indicated that they felt more comfortable experimenting with digital tools in their teaching after the training. Several teachers noted that prior to the program, they were hesitant or "timid" about using online platforms beyond basic necessities, but that the hands-on exposure during training helped demystify these tools. For example, one teacher wrote, "I am no longer afraid of technology in the classroom – now I use at least one new tool (like Padlet or Kahoot) in every lesson, and my students love it." This sentiment of overcoming technophobia and embracing digital tools was echoed across responses. Teachers credited the training with not only expanding their toolkit but also instilling the confidence to integrate technology meaningfully rather than viewing it as a gimmick. Another participant explained that the structured practice during workshops "made using these tools feel natural, so in class I can focus on teaching rather than worrying about the tech." Such feedback aligns with teacher development theories suggesting that guided practice and mastery experiences build self-efficacy. It also reinforces that the training achieved its intended outcome of enhancing Technological Knowledge (TK) and the willingness to apply it in pedagogical contexts. The increase in tech-confidence is particularly important in the Algerian higher education context, where digitalization is a growing priority; the teachers' newfound ease with technology positions them to be innovators in their departments.

Shift Toward Learner-Centered Pedagogy: The second major theme is a self-reported pedagogical shift in how teachers approach their classes, moving decidedly toward learner-centered methods. Many participants commented that the training helped them reflect on their prior teacher-centric habits and motivated them to involve students more actively in learning. As one teacher succinctly put it, “Now I act as a facilitator rather than a lecturer.” This shift was evidenced by descriptions of changes they implemented: for instance, designing activities where “students do the talking and problem-solving while I guide,” organizing more group work and discussions, and incorporating project-based tasks. Another teacher noted that after seeing the impact of interactive techniques during the training simulations, they realized students learn better when engaged: “I used to feel I must explain everything. After trying the new approach, I saw my students can discover answers themselves – it was an eye-opener.” Such reflections indicate a deeper conceptual change where teachers internalized student-centered pedagogy not just as a set of techniques but as a philosophy of teaching. Teachers also remarked on positive student reactions to this new approach, observing that learners were more motivated and participatory when given active roles. This reinforcement likely further solidified teachers’ commitment to learner-centered methods. In terms of teacher learning theory, these comments exemplify how beliefs and classroom practice can shift through reflective professional development: by experimenting with and witnessing the effectiveness of new strategies, teachers began to revise their own assumptions about teaching and learning. The theme of moving toward a facilitator role demonstrates that the training succeeded in prompting a pedagogical mindset shift, which is crucial for sustainable change in practice.

Perceived Relevance of Training to ESP Classroom Realities: The participants overwhelmingly found the content of the training to be highly relevant and applicable to their actual teaching contexts, which was another prominent theme. In their feedback, teachers praised the program for addressing real challenges they face in ESP classrooms in Algerian

universities. For example, one teacher wrote, “Every module of the training responded to a need I have felt in my classes – from using technology with large groups to designing tasks relevant to my students’ specializations.” Another commented, “Unlike some generic workshops, this training was tailored to our context. The examples and solutions were directly connected to what we encounter teaching ESP here.” This perceived relevance was further evidenced by teachers’ immediate application of training content, as noted in the observation results. Participants appreciated that the training covered not just theory but practical techniques (e.g., how to use Google Docs for collaborative writing or how to scaffold a technical reading lesson). They also noted the benefit of sharing experiences with peers during the training, which made the content feel authentic and grounded in local classroom reality. Thematically, this suggests that contextualization of professional development – aligning training content with the specific needs of ESP teaching in Algeria – was a key factor in its success. Several teachers explicitly mentioned that the training filled gaps in their prior preparation, which had been more general and did not focus on online pedagogy or ESP. In sum, the positive reception regarding relevance indicates that the program was well-targeted, increasing the likelihood that its impact will endure. It also highlights that for professional development to be effective, it must resonate with teachers’ day-to-day experiences, a principle supported by adult learning theories of relevance and immediate applicability of learning.

Suggestions for Further Training and Support: Despite the generally positive feedback, participants also provided constructive suggestions, aligning with an ethos of continuous improvement. A common suggestion was the desire for more advanced or ongoing training to build on what was achieved. Teachers expressed that the training opened up new possibilities, and now they wanted to delve deeper. For instance, one participant wrote, “The training was an excellent start. I’d love a follow-up series focusing on more advanced digital tools and instructional designs for ESP.” Others suggested extending the duration of the program or

having periodic refresher workshops: “Perhaps a longer training or spread over a semester would allow us to absorb more, as there is so much to learn,” and “We need ongoing communities of practice – maybe a monthly meet-up to exchange new ideas and troubleshoot challenges.” These suggestions underscore that professional development is not a one-off event for these teachers but a continuous journey. The desire for more advanced content also indicates that the participants have grown in confidence and now seek to further enhance their skills (e.g., exploring specialized educational software, learning analytics, or more sophisticated online pedagogical strategies). Additionally, a few teachers noted challenges they still face – such as limited infrastructure at their institutions or time constraints – and urged that future training or policies address these systemic issues (for example, ensuring stable internet access in all university classrooms, or providing recognition and incentives for teachers who innovate). Such feedback is valuable for designing the next steps of professional development and suggests that the program has instilled a proactive attitude in teachers: they are thinking critically about their needs and advocating for support, which is a hallmark of an empowered, reflective teaching community.

In reflecting on these themes collectively, the post-training feedback not only confirms the positive trends observed in the classrooms but also provides insight into the teachers’ reflective processes. The very act of articulating increased confidence, pedagogical shifts, and future needs indicates that participants are engaging in active reflection on their professional growth. This resonates strongly with models of reflective practice in teacher development. Through reflection, educators internalize experiences and can continuously improve their practice; indeed, by reflecting, teachers create an environment centered on learners and focus more on the learning process, which leads to improved outcomes; In our case, the teachers’ reflections show they have become more self-aware of their teaching approaches and more attuned to student learning, which should ultimately benefit their learners. The feedback themes

also suggest that the teachers have begun to view themselves as lifelong learners – seeking ongoing development – which aligns with the concept of teachers as reflective practitioners (Schön, 1983) and the idea of experiential learning cycles (Kolb, 1984) where experience, reflection, conceptualization, and new experimentation iterate. This cycle is evident: teachers tried new methods (experience), observed successes or challenges, reflected (as captured in the feedback), and are now conceptualizing needs for further learning and experimentation.

From a teacher learning theory perspective, the shifts reported (e.g. greater confidence, changed beliefs about teaching) can be seen as indicators of conceptual change and professional identity growth. According to Guskey's (2002) model of teacher change, meaningful professional development often results in changes in classroom practices first, which lead to improved student outcomes, and subsequently foster changes in teachers' beliefs and attitudes. Here, our participants experienced changes in practice (as observations showed), noted better student engagement, and in turn expressed changed attitudes (e.g., stronger belief in learner-centered methods). This alignment with established theory gives additional credence to the impact of the training program.

These findings carry important implications for Algerian higher education reform and policy. The positive outcomes demonstrate that, given targeted support and training, university teachers can significantly enhance their pedagogical skills – exactly the kind of improvement envisioned by national educational strategies. In Algeria's drive to modernize and improve the quality of higher education, there has been an explicit call to invest in teacher development and to integrate technology and innovative pedagogy in the classroom. For instance, recent reform initiatives stress the need to “reorganize the educational system and improve teaching methodology and teachers' training”, as well as to introduce digital tools into education. The success of this pilot professional development program aligns directly with these policy goals.

Teachers have not only adopted more modern, student-centered approaches but are also calling for ongoing upskilling, which suggests a receptiveness to the continuous improvement that policy makers seek. It supports the notion that reforms such as Resolution No. 1998 – which presumably advocate for pedagogical innovation and capacity-building in higher education – are on the right track by emphasizing teacher training. The teachers' increased confidence and shift in pedagogy contribute to building a culture of quality teaching and innovation within universities, which is essential for broader educational reform to take root.

The post-training phase results portray a story of positive transformation at the instructor level, with clear evidence of enhanced teaching practices and reflective growth. These improvements fulfill the objectives of the professional development initiative and resonate with both international models (like TPACK and reflective practice theory) and national educational priorities. The participants emerged from the program as more competent, confident, and learner-focused ESP educators. This outcome not only benefits their immediate students but also serves as a promising model for scaling such professional development across Algerian higher education. The findings suggest that empowering teachers through well-designed training can lead to meaningful pedagogical shifts – a critical component in achieving long-term educational reform and improving the quality of ESP (and other) instruction in the digital age.

3.3. Discussion of Findings

3.3.1. Summary of the Main Findings

Data collected from diverse tools—pre/post questionnaires, self-assessment checklists, training feedback, and classroom reflections—revealed a clear connection between the professional needs of ESP teachers and the relevance of the online pedagogy training provided.

The intervention served as a practical and moderate approach to enhancing digital teaching readiness, offering an initial framework that empowered participants to better meet the evolving expectations of their learners.

The **first research question** explored the specific competencies that ESP teachers need in order to succeed in online pedagogy. The findings clearly showed that while participants held foundational knowledge in teaching English, they lacked proficiency in key digital areas, including instructional design for online formats, the use of learning management systems, and student engagement techniques in virtual environments. Results from the pre-training assessments confirmed this gap, as most participants displayed limited experience with platforms such as Google Meet, Moodle, or interactive multimedia tools. Teachers also noted challenges in adapting ESP materials for remote delivery, indicating a pressing need for targeted support in both technological and pedagogical domains.

The **second research question** examined which strategies could effectively meet these professional development needs. Analysis of the training process revealed that structured, hands-on learning—integrating case-based modules, collaborative tasks, and peer review—significantly improved the teachers’ digital competencies. Participants expressed that real-world examples, personalized support, and reflective activities helped them internalize new knowledge and apply it in their own teaching contexts. As a result, many began to explore more student-centered approaches, such as using asynchronous discussions, flipped content, and topic-specific simulations. The training thus played a crucial role in facilitating not just technical familiarity, but pedagogical confidence and innovation.

As for the **third research question**, which focused on how specialized training influenced the effectiveness of ESP teachers, results showed a meaningful transformation in instructional delivery and teacher self-perception. Teachers reported increased ability to

manage online classrooms, integrate ESP content with digital tools, and address diverse learner needs through flexible, multimodal strategies. They also began to view themselves not merely as content transmitters but as facilitators of active, virtual learning. However, participants acknowledged that while the training served as a strong catalyst for professional growth, its long-term impact depends on sustained institutional support, regular practice, and individual commitment to ongoing development. Personal attributes such as openness, adaptability, and reflective thinking were repeatedly cited as vital for maintaining and extending the progress achieved through the training.

3.3.2. Findings from the Action Research Intervention

The first research objective was to identify the key competencies required by ESP teachers to succeed in online pedagogy. The pre-training phase, including the needs analysis questionnaire and classroom observations, revealed substantial gaps in technological and pedagogical preparedness. Many teachers were unfamiliar with essential digital tools, lacked structured approaches to online lesson planning, and had difficulties engaging students virtually. These findings confirm Hypothesis 1, which proposed that a detailed needs analysis would highlight the essential digital and pedagogical skills that ESP teachers require for effective online teaching.

The second research objective focused on examining the impact of a targeted training programme on improving these competencies. The results from the post-training observations and feedback questionnaire indicated significant improvement in teachers' abilities to integrate technology meaningfully into their lessons, to adapt ESP content for online formats, and to implement interactive, student-centred strategies in virtual environments. These outcomes support Hypothesis 2, which posited that a well-structured and context-responsive training course would address the core digital and pedagogical challenges faced by ESP teachers. For example, teachers who initially relied heavily on traditional lectures reported post-training that

they were able to use breakout rooms, interactive tasks, and formative assessment tools to foster student participation. Others demonstrated an increased ability to select and adapt digital content specific to their students' professional domains.

These changes were not only technical but also conceptual. Several teachers began to shift their mindset from viewing online teaching as a temporary alternative to face-to-face instruction, to recognising it as a distinct and valuable mode of education. This indicates that the training contributed to a broader professional development process, enabling teachers to reflect on and revise their pedagogical assumptions. Teachers reported feeling more confident, more organised, and more aware of how to make online learning purposeful and effective for their students.

Furthermore, the variation in improvement across participants demonstrates the importance of differentiated training. Teachers who had lower baseline scores in pre-training assessments tended to show the greatest progress, particularly in the domains of lesson design and digital classroom interaction. This finding confirms Hypothesis 3, which suggested that specialised training, tailored to the teachers' initial skill levels, would enhance their online teaching performance. Participants appreciated that the training was practical, contextualised, and responsive to their immediate needs. One teacher, for example, shared that they were now able to design an entire online module for engineering students, integrating industry-specific terminology with interactive digital tasks—something they had never attempted prior to the training.

Equally important was the collaborative element of the training. Teachers benefited from opportunities to exchange ideas, co-develop lesson plans, and observe one another's work. This peer learning environment helped build a sense of professional community, especially valuable given the isolation many had experienced during the earlier stages of the online transition. Teachers stated that seeing others experiment with new tools encouraged

them to take similar steps, and that the feedback they received during the sessions helped them refine their practices.

The training also raised teachers' awareness of the structural barriers that continue to affect online teaching. While individual skills improved, many participants expressed ongoing concerns about institutional support, access to reliable internet, student readiness, and the lack of recognition for digital teaching efforts. This feedback highlights that while teacher development is essential, it must be accompanied by broader systemic support in order to sustain progress. Without improvements in infrastructure and policy, some of the gains reported during the training phase may be difficult to maintain over the long term.

The findings of the study support all three hypotheses. The initial needs analysis clearly identified specific areas for development. The training programme successfully addressed those areas by enhancing both practical skills and pedagogical understanding. Moreover, by adapting the training to the participants' starting points and including a strong element of peer interaction and reflection, the intervention contributed to long-term changes in professional identity and teaching practice. These results suggest that ESP teacher development for online pedagogy should not only focus on tools and techniques, but also on mindset, collaboration, and sustainable support systems.

3.4. Implications of the Study

The findings carry significant implications for both practical initiatives and theoretical understanding in the field of ESP teacher development and online pedagogy. In particular, two broad domains emerge: (a) improvements in ESP teacher training and professional development structures, and (b) enhancements in online pedagogical practice, especially suited to low-resource or transitional contexts such as Algeria. The results not only illuminate where the gaps and needs are, but also point to how stakeholders might address them. In light of the

evidence, this study advocates for concrete steps to bridge the identified gaps and for rethinking existing policies and models. Below, we discuss the implications in detail, divided into two sub-sections for clarity.

3.4.1. Implications for ESP Teacher Training

Design of Training Programs: The study underscores the need for a fundamental redesign of ESP teacher professional development programmes in Algeria to meet the demands of online and blended teaching. Currently, as noted earlier, there is an absence of comprehensive formal training specifically targeting ESP instructors. This calls for the creation of structured training programmes that are tailor-made for ESP contexts. Such programs should be needs-based, beginning with a thorough assessment of what teachers require (e.g. proficiency in using virtual learning environments, strategies for online student engagement, subject-specific English resources, etc.). In practical terms, training content must integrate technology, pedagogy, and content knowledge – mirroring the TPACK framework – rather than treating ICT skills in isolation. For example, instead of generic computer literacy classes, workshops could focus on how to use a platform (like Moodle or Zoom) to teach, say, Business English interactively. International best practices suggest that active, experiential learning within PD is most effective: teachers could engage in micro-teaching sessions online, design mini virtual lessons, and receive feedback.

Embedding these elements would move training beyond lectures on theory to hands-on pedagogical practice in a digital environment. Notably, the duration and continuity of PD should be addressed. One-off workshops are insufficient; participants in our study voiced preference for longer-term courses or a series of sessions that allow them to apply new skills gradually and return with questions or reflections. This aligns with the broader notion that teacher learning is an ongoing process, not a single event. Therefore, a structured programme

might run over a semester with periodic meetings, mentoring check-ins, and a final capstone project (such as creating an online ESP course module). By adopting such designs, training can better achieve sustained impact.

Policy Reform and Support: At the policy level, the implications are equally compelling. The findings signal that systemic support and clear policies are necessary to institutionalise improvements in teacher development. Given that “the absence of ESP teacher training programs” has been identified as a national weakness, educational authorities (the Ministry of Higher Education and university leadership) should prioritise establishing and funding official ESP teacher development initiatives. For instance, a national ESP teacher development centre or scheme could be introduced, which coordinates the design of curricula for training and ensures consistency across universities. The government’s recent push for English in higher education (EMI policy) will only succeed if accompanied by investment in teacher capacity. This could mean allocating budget specifically for upskilling language teachers in digital pedagogy. There is an implication here for cross-institutional collaboration: universities in Algeria might form a consortium to develop shared online training resources, so that expertise is pooled and not every institution has to start from scratch. Additionally, policy reform can incentivise teacher participation in PD. For example, making professional development a criterion for promotion or providing certificates that count towards career advancement would encourage more ESP teachers to engage. Another policy implication is ensuring sustainable financing for these programmes.

Researchers have argued that an e-learning professional development strategy should be “developed by Algerian universities and financed by the ministry of higher education”. Our study fully supports this view – without dedicated funding, efforts will likely be patchy and short-lived. In practical terms, this might involve earmarking funds for digital infrastructure

(so that training can include practice with up-to-date tools) and for hiring or developing expert trainer cadres. Moreover, the policies should allow flexibility and local adaptation: universities vary in their needs and capacities, so a one-size policy could be less effective than guidelines that institutions adapt to their context. In sum, the implication is that policy-makers must take a proactive, facilitative role by creating an enabling environment for teacher growth, rather than expecting individual educators to improvise solutions.

In-Service Teacher Support: Beyond formal training events, the study points to the need for robust in-service support mechanisms. Teachers will require ongoing guidance as they implement new online pedagogies. One implication is to establish mentorship and peer support systems within institutions. For instance, pairing less-experienced teachers with mentors who have stronger digital skills can facilitate on-the-job learning – a recommendation supported by similar research in other contexts. Our findings that peer collaboration enhanced confidence suggest that creating communities of practice is highly beneficial. Departments or regional clusters of ESP teachers could hold regular meet-ups (virtual or face-to-face) to share experiences, troubleshoot common problems, and exchange teaching resources. This collegial environment can mitigate the isolation many felt during the emergency remote teaching phase. Additionally, the creation of an online platform or portal for ESP teacher development could be an effective support tool. This could be a website or LMS where teachers can access resources (lesson plans, tutorials, articles on ESP methodology), ask questions in forums, and perhaps even attend mini-courses asynchronously.

Such an idea echoes earlier proposals for web-based PD in Algeria where “e-learning web-based projects are needed for giving teachers necessary feedback and help their professional development”. If implemented, a centralized portal maintained by a network of teacher educators could provide just-in-time support – for example, a teacher struggling with a

virtual classroom tool could find a quick guide or post a question to colleagues. It is also important that institutional leaders provide time and recognition for ongoing PD. Teachers in our study often cited workload and time constraints as barriers to learning new practices. Thus, universities might consider measures such as reduced teaching loads or designated “professional development days” to allow teachers to focus on skill enhancement. In conclusion, the implication is that improving ESP teacher capacity for online pedagogy requires an ecosystem of support: formal training to build knowledge, coupled with continuous in-service scaffolding to refine and sustain that knowledge in practice.

To summarise the key practical implications for ESP teacher training and development emerging from this study, we propose the following actions:

- **Establish Dedicated ESP–Digital Training Programmes:** Create formal training programmes or certificate courses focusing on ESP and online pedagogy, to address the current void in structured ESP teacher education. These should integrate technology with pedagogical and content training (following a TPACK-informed approach) rather than treating them separately.
- **Integrate Needs Analysis into PD Design:** Base the content of professional development on a systematic needs analysis of teachers. Training modules should directly target the gaps identified (e.g. using Moodle for ESP, online assessment methods, subject-specific content creation), ensuring relevance and high impact.
- **Policy and Funding Support:** Enact policy measures that institutionalise ESP teacher development – for example, a national mandate or strategy for e-learning oriented PD. Secure funding through the Ministry so that universities can implement these programmes sustainably. Policy should also tie PD to career progression, motivating teachers to participate.

- **Mentorship and Communities of Practice:** Implement mentorship schemes that pair novice with experienced teachers to foster mutual learning and bridge skill gaps. Concurrently, cultivate communities of practice (both online and offline) where ESP teachers regularly share experiences, resources, and solutions, thereby normalising continuous professional growth.
- **Ongoing Technical and Pedagogical Support:** Provide platforms (helplines, forums, resource centres) for on-demand support. Ensure each institution has a support team or “digital pedagogy coach” role to assist teachers in real time as they experiment with new online teaching techniques. Over time, this can build an internal culture of support and innovation.

These implications for ESP teacher training aim to create a comprehensive professional development framework that addresses immediate needs and fosters long-term growth. Implementing these changes would move Algerian higher education closer to having a cadre of ESP teachers who are not only content experts and skilled language instructors, but also confident and competent online educators.

3.4.2. Implications for Online Pedagogy in ESP

The study’s outcomes also shed light on best practices and considerations for online pedagogy in English for Specific Purposes, particularly suited to contexts that are low-resource or in transition (such as Algeria’s shift towards more English and more digital learning). One clear implication is that effective online ESP teaching requires adaptation and localisation of pedagogical strategies. International models of online teaching cannot simply be copy-pasted into the Algerian context; rather, practices must be tailored to the realities of students’ access, institutional infrastructure, and cultural expectations. For example, given that many students (and indeed some teachers) may face limited connectivity, pedagogical approaches should

make use of low-bandwidth solutions: asynchronous forums, email, and offline digital resources can complement live video sessions.

Teachers might organise blended activities where students prepare offline (e.g. by reading or listening to pre-downloaded materials) and then come online for shorter interactive discussions, thereby mitigating connectivity issues. This approach is supported by our participants' experiences – those who achieved better student engagement often combined modes and were flexible, an approach that should be encouraged as a best practice in similar environments. The broader implication is that online pedagogy training for ESP teachers should include guidance on managing constraints. This could cover technical tips (such as compressing presentation files, using mobile-friendly platforms) as well as methodological strategies (such as having a Plan B for when live connections fail, or using project-based learning that students can carry out off-screen). By preparing teachers to be pedagogically agile, we enhance the resilience of online education in face of infrastructural challenges.

Another implication concerns the content and materials used in online ESP courses. The research highlighted issues of misaligned or insufficient materials for specific purposes in the digital realm. Some teachers noted that the only available resources were generic English language materials not tailored to their students' specialisations, which echoes earlier findings about “misaligned materials” being a problem in ESP instruction. Therefore, a key implication is the development of subject-specific online materials and activities. Stakeholders might invest in creating digital resource banks for, say, English for Medicine, English for Engineering, etc., which teachers can draw upon. Additionally, training should equip teachers with materials development skills so they can adapt content themselves – for instance, learning how to create interactive quizzes relevant to their field or record short instructional videos on specialised vocabulary.

The use of Open Educational Resources (OERs) can be promoted: teachers can be shown how to find and adapt OERs that fit their course outcomes. Over time, local teacher communities could collectively author and share materials, gradually building a repository of locally relevant ESP e-content. This emphasis on context-appropriate resources supports a more learner-centred pedagogy, as materials directly address the needs and scenarios that learners (e.g. engineering students, business students) will encounter. It also contributes to sustainability: once teachers learn to create their own digital content, they become less dependent on imported textbooks or one-size-fits-all solutions.

The findings also imply that online pedagogy should leverage interactive and collaborative learning, especially for ESP where communication skills are paramount. Traditional teacher-centred methods translate poorly to the online environment – a lecturer simply talking through slides in a virtual class is unlikely to keep students engaged. Many participants in our study who had initial trouble with student engagement later found success by incorporating more interactive techniques (such as breakout group discussions, virtual role-plays, collaborative writing using Google Docs, etc.). Thus, a best practice is to make use of the communicative tools available in online platforms to foster active learning. For instance, an ESP teacher might set up a simulation activity where students in an “English for Tourism” class act out a hotel check-in scenario via a video call, or engineering students collaborate to read and summarize a technical manual, communicating in English through a forum. These activities mirror real-world tasks and keep the online classroom dynamic. The implication is that training and guidelines should emphasise student-centred online teaching. Teachers may need specific ideas and templates for such activities, particularly if they are more accustomed to lecture-driven approaches.

Additionally, encouragement of formative feedback and reflective practice is important: online tools (like polls, quizzes, exit surveys) allow teachers to gauge student understanding in real time and adjust their methods. By regularly reflecting on what works and what doesn't in the online format – for example, through teacher peer discussions – instructors can continuously improve their online pedagogy. This culture of reflective practice in digital teaching should be cultivated as part of the professional development follow-up (as mentioned in 4.4.1).

Considering the transitional context of Algeria (and similar contexts), where there is an ongoing movement from traditional approaches to more innovative ones, the study suggests that change should be gradual and supportive. Many ESP teachers are not only transitioning to online modes but also adjusting to a greater emphasis on English in higher education. An implication here is that institutions might adopt a phased approach to implementing online ESP pedagogy. For example, in the immediate term, focus on ensuring every course has at least a basic online presence (uploading materials, communicating via email or LMS), then progressively introduce more sophisticated e-learning elements as teachers grow in confidence. This phased strategy prevents overload and allows success to build incrementally. It is also important for administrators to set realistic expectations: the data from our study reflects that quality online teaching is a skill that takes time to develop. Thus, during the transition, measuring progress (in terms of teacher competency and student outcomes) is more appropriate than expecting perfection in the first iteration of online courses.

Over the last two years, Algerian universities have indeed moved to a blended learning model; our findings inform this policy by highlighting what teachers specifically need in order to make blended learning effective. For instance, if teachers are blending face-to-face with online, they need to know how to decide which activities are better done in person and which

online – a pedagogical design skill that should be part of their training. As a practical implication, guidelines for blended course design could be developed at the institutional level, drawing on teacher feedback and the challenges noted in this research.

From a theoretical standpoint, the implications for online pedagogy reinforce the importance of frameworks like TPACK and community-based learning in digital environments. The study's results suggest that training teachers in technology usage alone is insufficient; they also need to learn when and why to use those technologies in service of language learning goals. This supports the idea that any model of teacher development for online pedagogy must integrate technical, pedagogical, and content dimensions seamlessly. It further implies that future research and theory-building in ESP pedagogy should incorporate variables of context – for example, developing models of online teaching that factor in resource limitations or multilingual settings. The Algerian experience can offer insights for other low-resource settings: it underscores that theories of online pedagogy and teacher development must be adaptable and not assume Western-level infrastructure or homogeneous student bodies. In practical terms, this could mean expanding TPACK to explicitly account for contextual knowledge (some scholars speak of “TPACK+” or adding a context ring around the core domains).

The implications for online pedagogy derived from this study call for contextualised, interactive, and resource-sensitive teaching practices. By training ESP educators to be resourceful and student-centred in the digital space, and by providing them with appropriate materials and support, educational institutions in Algeria and similar contexts can significantly enhance the effectiveness of online ESP instruction. This will not only improve immediate teaching outcomes but also ensure that moves toward digital learning and English-medium instruction are successful and sustainable.

3.5. Conclusion

This study set out to investigate and enhance our understanding of how ESP teacher professional development can be improved to better prepare educators for online pedagogy in Algerian higher education. Through a mixed-methods exploration of teachers' experiences, competencies, and needs – including both quantitative survey data and qualitative interviews – the research has illuminated critical gaps and opportunities in the current system. The key contributions of the study can be summarised as follows. First, it provides empirical evidence of the state of ESP teacher readiness for online teaching in a context (Algeria) that has been under-researched in this regard. The findings definitively show that, while teachers are eager to adopt digital modes and recognise their importance, they lack sufficient training and support to do so effectively. This confirms the assertions in literature that without formal preparation, even motivated teachers struggle with the demands of e-learning. Second, the study contributes a contextualised understanding of professional development needs, highlighting that solutions must be tailored to the specific environment.

By employing frameworks like TPACK and conducting a needs analysis, we identified concrete areas (technical skills, pedagogical strategies for online engagement, subject-specific material development, etc.) where interventions can be focused. These nuanced insights go beyond generic calls for “more training” by pinpointing what kind of training is needed and in what areas, thereby providing a roadmap for actionable improvements. Third, the study bridges theory and practice by interpreting the findings through established models of teacher development and educational technology integration. For instance, it illustrates how TPACK can be applied as an analytic tool in ESP contexts, and how theories of communities of practice are directly relevant to building teachers' capacity in a low-resource setting. In doing so, it not

only diagnoses problems but also aligns them with theoretically grounded solutions (such as mentorship, peer learning, and iterative learning-by-doing).

The significance of these contributions is manifold. On a practical level, the research arrives at a pivotal moment for Algerian higher education, which is undergoing both a digital transformation (accelerated by the pandemic and the move towards blended learning) and a linguistic shift (with greater emphasis on English in academia). The study's insights offer guidance to policy-makers, teacher trainers, and institutional leaders on how to support ESP educators through these transitions. Concretely, the recommendations provided – from establishing dedicated training programmes to nurturing communities of practice – can inform strategic plans and professional development curricula in the immediate future. By addressing an identified gap (the lack of systematic ESP teacher training), this thesis supports ongoing educational reform efforts in the country.

On a theoretical level, the study adds to the body of knowledge in ESP and teacher education by providing evidence from a non-Western, resource-limited context. It reinforces the idea that context greatly matters: theories of online pedagogy and teacher learning gain validity only when they account for on-the-ground realities such as those documented here (infrastructure issues, policy-practice gaps, cultural factors in teacher training). Thus, the work contributes to a more inclusive understanding of teacher development, one that includes voices and data from the Global South. It echoes calls for more research to “ensure high-quality [ESP] courses” through qualified practitioners and context-sensitive approaches, thereby pushing the discourse beyond predominantly Euro-American settings. Moreover, the methodological approach of combining quantitative and qualitative data in a needs analysis can serve as a model for similar studies seeking a comprehensive picture of educational challenges.

Despite its limitations (as outlined in Section 4.5), this study opens up several avenues for future research. One important direction would be to design and implement an intervention based on the findings – for example, developing a pilot ESP teacher training module focused on online pedagogy, rolling it out in a few universities, and evaluating its impact on teachers' classroom practices and student outcomes. Such an experimental or action-research approach would directly test the recommendations of this thesis and provide evidence of what works best in practice. Future research could also adopt a longitudinal perspective: following a cohort of ESP teachers over time as they receive training and adapt to blended learning would yield insights into the process of change and the sustainability of professional development outcomes. Another avenue is to broaden the scope beyond ESP in the narrow sense; comparative studies could examine if general EFL (English as a Foreign Language) teachers or teachers of other subjects in Algeria face similar issues with online pedagogy, or if the ESP context has unique challenges that require specialised solutions.

Additionally, given the importance of peer support noted in our study, researchers might explore the dynamics of teacher networks and communities in more depth – for instance, using social network analysis to see how information and skills diffuse among educators when a new pedagogical approach is introduced. On the technology front, as Algerian universities improve their infrastructure, future work could investigate the efficacy of specific tools or platforms (for example, the role of mobile learning in ESP, or the use of MOOCs and online courses for teacher self-development). Finally, extending the research to student perspectives would be valuable: understanding how students in ESP courses experience the shift to online learning, and how teacher development (or lack thereof) affects their learning outcomes, could powerfully advocate for investment in teacher training by linking it to student success.

The research has highlighted that improving ESP teacher professional development for online pedagogy in Algerian higher education is both a pressing need and a achievable goal. By critically examining the current state of affairs and drawing connections with global best practices and theories, it provides a foundation upon which stakeholders can build. The journey to change is admittedly complex – it involves individuals growing in their competencies and institutions evolving in their support systems – but it is a journey that the evidence presented here deems necessary. As Algeria and countries like it strive to modernise education and bridge gaps between local realities and global trends, the role of the teacher remains paramount. Empowering ESP teachers with the knowledge, skills, and support to thrive in online environments will not only elevate the quality of English language education for specific fields but also contribute to the broader goals of educational excellence and equity in the digital age. It is the researcher's hope that the findings and recommendations of this study will inform meaningful developments in policy and practice, and that future research will continue to build on this work, driving forward the professional growth of ESP educators and the success of their students in an ever-changing educational landscape.

CHAPTER FOUR:

A PATHWAY FOR

IMPROVING ESP

TEACHERS FOR ONLINE

PEDAGOGY

CHAPTER FOUR: A PATHWAY FOR IMPROVING ESP TEACHERS FOR ONLINE PEDAGOGY

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4.1. Introduction

This chapter synthesizes the main findings of the study and considers their implications for ESP teacher professional development in online pedagogy within Algerian higher education. Its purpose is twofold. First, it consolidates the principal insights emerging from the needs analysis, training intervention, post-training observations, and participant feedback. Second, it translates these findings into recommendations for policy, practice, and future research while remaining attentive to the limitations of the study.

The chapter does not assume that the results of a small-scale intervention can be generalized without qualification. Rather, it interprets the findings within the specific scope of the study, namely a mixed-methods action research project conducted with eight in-service ESP teachers. For this reason, the recommendations presented here are divided conceptually into two categories: those that are directly supported by the evidence generated in the present study, and those that should be treated as forward-looking proposals requiring pilot, institutional adaptation, or further empirical validation. This distinction is essential in order to maintain alignment between the study's evidence base and the claims derived from it.

The chapter therefore begins by synthesizing the main research findings, then addresses the study's limitations, and finally presents evidence-based recommendations alongside broader proposals for future institutional and policy development. In doing so, it aims to offer a realistic and context-sensitive contribution to discussions of ESP teacher development in Algeria rather than a universally generalizable model.

4.2. Synthesis of Research Findings

The main outcomes of the action research intervention and presents a consolidated picture of what changed in ESP teachers' online pedagogical practice after the training programme. It synthesizes evidence from the needs analysis, the pre- and post-training

observations, and teachers' feedback in order to identify the most consistent patterns of improvement as well as the areas where challenges remained. Rather than repeating the detailed statistical reporting of Chapter Three, this section highlights the overarching impact of the intervention and clarifies what the findings mean for building a structured, sustainable pathway for ESP teacher professional development in Algerian higher education

4.2.1. Overall Impact of the Intervention

The study tracked eight ESP teachers (P1-P8) across three phases of the action research cycle, measuring changes in digital proficiency, pedagogical strategies, student engagement, and professional confidence. The convergence of quantitative (observation checklist ratings, questionnaire responses) and qualitative evidence (teacher reflections) reveals consistent, positive change across multiple domains.

Pre-Training Baseline: At the outset, teachers reported moderate to low confidence in online teaching (median rating: 2.5 on a 5-point scale). Classroom observations revealed predominantly teacher-centered instruction, minimal interactive elements, and limited use of technology beyond basic LMS features. Teachers identified skill gaps in five key areas: creating interactive content, managing student engagement remotely, facilitating real-time participation, integrating multimedia, and providing meaningful feedback in asynchronous modalities. These findings aligned with the pre-training questionnaire data, in which 75% of participants reported feeling unprepared for online ESP delivery.

Post-Training Transformation: Following the six-day training intervention, all eight teachers demonstrated observable improvements in online instructional practices. Quantitative comparison of pre- and post-observation checklist ratings showed consistent upward trends:

Teaching Dimension	Pre-Training Mean	Post-Training Mean	Improvement
Student Interaction Level	2.1	4.2	+2.1
Use of Multimedia/Digital Tools	1.8	4.0	+2.2
Lesson Structure & Organization	2.4	4.3	+1.9
Feedback & Assessment Practices	2.0	3.9	+1.9
Teacher Confidence (Self-Report)	2.5	4.6	+2.1

Table 4. 1. Pre-Training and Post-Training Comparison of Teaching Practices Across Key Dimensions (n=8)

All teachers reported "Agree" or "Strongly Agree" (median: Strongly Agree) with the statement "I feel more confident teaching online after this training." Qualitatively, teachers articulated specific pedagogical shifts: one teacher noted, "Before, I was at a loss with student interaction online. Now I have a toolkit of ideas to try, and I've seen that they actually work." Another reflected, "I learned how to plan my online lessons better thinking in terms of phases and not just content."

4.2.2. Key Dimensions of Change

4.2.2.1. Digital Proficiency and Tool Competence

The training significantly reduced the "intimidation factor" associated with technology. Teachers moved from viewing digital tools as obstacles to recognizing them as pedagogical enablers. Specific competencies developed included:

- Proficiency with videoconferencing platforms (Zoom, Teams) for facilitating interactive sessions, managing breakout rooms, using polling and chat features for engagement
- Ability to design and deploy digital formative assessments (quizzes, discussion forums, digital portfolios)

- Confidence in selecting and adapting open educational resources (OERs) and creating context-appropriate digital materials
- Basic competence in recording, editing, and integrating short instructional videos into ESP lessons
- Understanding of learning management system (LMS) capabilities for course organization, resource sharing, and student tracking

Teachers also reported diminished anxiety about technical problems. One participant noted planning to "keep experimenting with one new tool each month," illustrating a shift toward proactive, self-directed technological growth rather than defensive avoidance.

4.2.2.2. Pedagogical Strategies and Instructional Design

The most striking change involved the structure and interactivity of lessons. Pre-training observations frequently documented classes that were essentially prolonged lectures or teacher-led explanations. Post-training, a typical class incorporated distinct instructional segments: an interactive warm-up activity, a content delivery phase, interactive practice or collaborative task work, and a structured wrap-up. Teachers explicitly cited exposure to the Instructional Systems Design (ISD) principles covered in training particularly the importance of segmenting lessons into phases rather than treating them as undifferentiated time blocks.

Teachers also embraced increased student talking time and collaborative learning. A Business English teacher effectively managed breakout room discussions after training: he provided clear pre-task instructions, used the broadcast feature to guide participants, and orchestrated whole-class debriefing, demonstrating mastery of synchronous group facilitation. An Engineering ESP instructor incorporated live polling at lesson start to activate prior knowledge, a technique directly learned during training Session 3.

4.2.2.3. Student Engagement and Participation Patterns

Pre-training observations noted low student participation in online classes, with students frequently silent or camera-off. Teachers attributed this to technical barriers and perceived student disengagement with remote learning. Post-training, observable shifts included:

- Increased frequency of student contributions (oral and written)
- More varied participation modalities: hand-raising, chat comments, breakout room discussions, poll responses
- Higher proportion of student-centered vs. teacher-centered talk
- Greater student initiative in asking questions and seeking clarification

Teachers reported using specific engagement strategies learned in training: using chat for lower-stakes contributions before calling on students, employing non-verbal feedback (thumbs-up reactions in Zoom), structuring tasks with explicit role assignments in group work to ensure all students contribute, and building in reflection or processing time rather than rushing through content.

4.2.2.4. Reflective Practice and Professional Agency

A notable shift occurred in teachers' mindsets about teaching and learning. Pre-training, many teachers approached lessons reactively delivering content and assigning work without deliberate reflection on design choices. Post-training, teachers articulated more intentional pedagogical reasoning. Several mentioned that the training process itself analyzing their baseline practices, reflecting on gaps, experimenting with new strategies, observing peers, and discussing outcomes had cultivated a "researcher-minded" orientation to teaching.

Comments such as "I never thought about why I choose certain activities before" and "Seeing how others adapted the same technique for their subject matter gave me confidence to try

things" indicate growth in reflective capacity and professional collaborative learning. Teachers also demonstrated comfort acknowledging difficulties and gaps, a hallmark of reflective practice. One participant discussed troubleshooting a technical glitch during online assessment, then noting how she "adapted on the fly" and would "look into better ways to set this up" illustrating resilience and growth mindset.

4.2.3. What the Data Reveals: Beyond the Numbers

While quantitative metrics show consistent improvement across all eight participants, the story behind the numbers reveals deeper insights about how teacher transformation actually occurs and what mechanisms drive sustainable change. This section unpacks three critical patterns that emerged across the study period, moving beyond descriptive findings to interpretive analysis that illuminates the dynamics of professional development in the online ESP teaching context.

The Confidence Threshold: A Foundation for Risk-Taking

One of the most striking patterns across the eight teachers was the centrality of confidence in enabling behavioral change. Teachers began the study reporting moderate to low confidence in online teaching (median rating 2.5 on a 5-point scale), and this low baseline was associated with cautious, technology-avoidant practices. Post-training, all eight teachers reported confidence levels at the "Agree" or "Strongly Agree" level with the statement "I feel more confident teaching online," representing a substantial psychological shift.

However, confidence was not merely a pleasant outcome it functioned as the gateway to action. Teachers with increased confidence began to experiment they volunteered to try new tools, raised hands to share ideas with peers, and articulated plans to continue developing ("I plan to keep experimenting with one new tool each month"). In contrast, those who maintained lower confidence levels remained cautious and hesitant about implementing new strategies even when they understood the concepts intellectually. This pattern aligns with Bandura's concept

of self-efficacy, which posits that belief in one's capability to succeed predicts willingness to undertake new behaviors far more reliably than knowledge or skill alone.

The mechanism appears to operate as follows: low confidence creates anxiety about failure, which triggers avoidance behaviors. When teachers were given low-stakes practice opportunities in the training environment and experienced small successes, confidence increased. With increased confidence came willingness to take risks—to try a breakout room activity, to turn on a camera, to use chat for engagement. These attempts in real classrooms, when they succeeded (and they usually did, because teachers had been trained), generated positive feedback from students and self-observation of improved engagement. This success reinforced confidence, creating a virtuous cycle.

One Business English teacher exemplified this dynamic: initially he expressed anxiety about managing synchronous group work, fearing technical failures and student disengagement. After the training module on facilitating breakout rooms (which included hands-on practice in a safe environment), his confidence increased noticeably. He then attempted a complex breakout room task in his real class, it went well, and he subsequently reported feeling "much more confident managing groups online." This teacher continued to refine the strategy in subsequent weeks, suggesting that initial success created momentum for continued experimentation.

The confidence threshold finding has important implications for implementation. It suggests that building teacher confidence is not a peripheral concern but rather a central mechanism through which professional development creates change. Training programs that focus exclusively on content delivery or technical instruction, without explicitly attending to confidence-building through supportive environments, peer validation, and structured success experiences, may not generate the behavioral change they intend.

The Pedagogy-First Principle: Foundation for Tool Selection

A second critical pattern emerged regarding the relationship between pedagogical understanding and technology integration. Teachers who approached online instruction by first clarifying their pedagogical goals the learning interactions they wanted to facilitate, the types of student engagement they valued, the lesson structure that would support deep learning—subsequently made more effective and strategic technology choices. Conversely, teachers who began by "collecting tools" without strong pedagogical grounding sometimes accumulated impressive technical skills that they rarely applied meaningfully to teaching.

This pattern can be illustrated through contrast. Two teachers in the study began with similar moderate levels of technology confidence. Teacher A (Business English) approached training by asking: "What are the main challenges in online ESP teaching? How do I structure lessons to overcome those?" He learned that lecture-format instruction yields low participation in online settings, and he focused on understanding group discussion and collaborative learning principles. Only then did he ask: "What tools enable these interactions?" His discovery of breakout rooms, pre-task sequencing, and broadcast features came as answers to pedagogical questions, not as standalone tools to learn. He integrated these features into lessons with clear pedagogical intent.

Teacher B (Engineering ESP) began by asking: "What's the latest technology I should know?" He enthusiastically learned multiple Zoom features, experimented with recording options, explored screen-sharing, and mastered polling functions. However, without a clear pedagogical framework guiding tool selection, many of these features remained underutilized in his actual teaching. He might use polling randomly, or record lessons without clear purpose, because the pedagogical goal that would justify these tools' use had not been clarified.

By mid-semester, Teacher A's students showed substantially higher engagement and participation. Teacher B's teaching appeared technologically sophisticated but remained

relatively traditional in structure and interaction patterns. Notably, Teacher B later indicated that the training content on Instructional Systems Design principles (lesson phases, task sequencing, interactive practice design) proved more transformative than the technology modules, because it finally provided the pedagogical framework for making technology choices.

This pattern reflects what educational researchers' term Technological Pedagogical Content Knowledge (TPACK) the understanding that technology is not valuable in isolation but only when it serves clear pedagogical purposes within specific content domains. The finding suggests that training which emphasizes "why before how" which builds strong pedagogical grounding before introducing tools yields deeper and more sustainable integration of technology into teaching practice.

The implication for professional development design is that technology skills matter less than the pedagogical knowledge that directs their application. Programs that sequence their content to establish pedagogy first, then select tools strategically to enact that pedagogy, are more likely to produce meaningful classroom transformation.

The Reflection Effect: Reflection as the Engine of Change

A third critical pattern concerns the role of structured reflection in driving deeper professional learning. The training intervention incorporated multiple reflection opportunities: individual pre- and post-observation reflections, whole-group debriefing sessions after teaching practice, peer discussion circles where teachers shared challenges and strategies, and individual mentoring conversations focused on analyzing practice. Teachers who engaged genuinely in these reflection activities who articulated their own questions, listened to peers' perspectives, and examined their practice critically showed the deepest shifts in pedagogical thinking and the most sustained commitment to continued development.

One striking observation was that several teachers initially resisted reflection activities, preferring "just tell me what to do" approaches. However, by mid-program, these same teachers frequently cited reflection as the most valuable component. One Engineering ESP teacher commented: "Before training, I just delivered lessons. I never thought about WHY I chose certain activities. Now, because we had to explain our thinking in the group, I see how to be more intentional." Another noted: "Seeing how other teachers adapted the same technique to their discipline gave me confidence to try things and also made me realize I should be thinking about WHY I'm making my choices."

This shift from resistance to reflection toward valuing it as central to learning—occurred because teachers directly experienced how reflection created clarity about their practice. When a teacher articulated a problem ("I can't get students to participate"), the group explored together what might cause it and what strategies might help. The collaborative reflection transformed the problem from a personal inadequacy into a shared challenge with potential solutions. Moreover, reflection created a "researcher mindset" where teachers began asking "What works for my students?" rather than "What am I supposed to do?" This mindset shift was associated with the higher-order professional agency observed in post-training teaching.

Reflection also functioned as the mechanism through which informal peer learning translated into professional development. When teachers observed a peer's successful strategy and discussed it ("What made that work? How could you adapt it? Would it work in your context?"), the reflection process extracted the underlying principles that could transfer to their own teaching. Without reflection, observation alone might yield surface copying of techniques. With reflection, it generated transferable understanding.

The importance of reflection aligns with Schön's theory of reflective practice (1980), which posits that professionals develop expertise through cycles of action, observation,

reflection, and refined action. In this study, the action research design itself where teachers taught, were observed, reflected on the observation, discussed with peers, and planned adaptations created the conditions for genuine professional learning. Teachers' comments suggest they internalized this cycle: even after formal training ended, some teachers indicated they would "keep doing what we did in training—trying something, thinking about how it went, and trying again differently."

These three patterns, confidence as prerequisite for action, pedagogy-first thinking as guide for tool selection, and reflection as the engine of learning do not operate in isolation. Rather, they interact synergistically. Confidence enables teachers to engage authentically in reflection despite vulnerability. Reflection builds the pedagogical understanding needed for strategic tool use. And successful tool implementation (enabled by pedagogy-first thinking) generates confidence. Together, they explain not just THAT the intervention worked, but HOW it functioned to transform practice. This analysis suggests that effective professional development in online teaching requires attention to all three elements: confidence-building environments, pedagogical conceptual frameworks, and structured reflection processes. Programs that attend to only one dimension may produce limited and unsustainable change.

4.3. Limitations of the Study

This section outlines the main constraints that shaped the scope and interpretation of the present study. It addresses the methodological and contextual factors, including the size and composition of the participant group, the time frame of the intervention, and the limits of the data-collection instruments, all of which may affect how far the findings can be generalized beyond the immediate setting. By acknowledging these limitations transparently, the study strengthens the credibility of its conclusions and provides a realistic basis for the recommendations and directions for further research that follow.

4.3.1. Sample Size and Selection Bias

The study involved eight ESP teachers from various Algerian universities, representing a purposive sample of volunteers interested in professional development. While this sample size is relatively small and therefore limits statistical power and broad generalizability to the larger population of Algerian ESP teachers, it was considered appropriate for the nature and scope of the present study. Since the research adopted an action research design and relied on the training intervention as the researcher's main pedagogical intervention, the study required a group size that would allow for intensive engagement, close follow-up, and meaningful observation of individual development.

More specifically, the limited number of participants made it possible to provide more effective and individualized support during the training process. The online training environment and the platform-based activities required careful monitoring, direct interaction, and continuous pedagogical accompaniment. A larger group would likely have reduced the possibility of focusing on each participant's needs, progress, and difficulties in sufficient depth. In this sense, the sample size was not only a methodological limitation, but also a deliberate choice aimed at ensuring the quality, intensity, and manageability of the intervention. The decision to work with a small group was therefore consistent with the logic of action research, which privileges close engagement with participants and detailed examination of change in practice over large-scale representativeness.

In addition, the online training platform and the practical activities carried out during the intervention were more effectively managed with a limited number of participants. The training format allowed the researcher to concentrate on each participant individually, provide immediate guidance, and support better mastery of the platform and the pedagogical tools

introduced during the sessions. This individualized focus would have been far more difficult to achieve with a substantially larger cohort.

At the same time, this choice inevitably places limits on the extent to which the findings can be generalized. The participants were volunteers and were likely more motivated, more open to innovation, and more willing to engage in professional development than the wider ESP teacher population. As a result, the findings should be interpreted as demonstrating what can be achieved under supportive and focused training conditions with engaged participants, rather than as a direct representation of the situation of all Algerian ESP teachers. Scaling the intervention to larger or more diverse cohorts would require additional institutional support, differentiated training structures, and careful adaptation to less homogeneous and potentially less motivated groups.

Nevertheless, the small sample should also be understood as a useful starting point rather than a weakness that invalidates the study. As an initial intervention-based investigation, this research opens the door for future studies that may broaden the sample, include teachers from a wider range of institutions and regions, and test the same model under different conditions. In this respect, the present study may be seen as a first step toward a broader research agenda on ESP teacher professional development for online pedagogy in Algeria. Future research can build on this initiative by expanding the participant pool and examining whether similar outcomes can be achieved at a larger scale.

4.3.2. Temporal Constraints and Short-Term Measurement

The training intervention and evaluation occurred within a single academic semester. Post-training observations were conducted 6–8 weeks after the intervention's conclusion. This timeframe, while adequate for measuring immediate impact, is insufficient for assessing long-term retention and persistence. It remains unclear whether teachers will maintain the new

practices and confidence gains six months or one year after the intervention, or whether these practices will gradually diminish without ongoing support.

The timeframe is also insufficient for examining the longer-term evolution of competence. Initial training can create foundational knowledge and motivate experimentation; however, expertise in online ESP pedagogy is likely to develop through sustained practice, reflection, and refinement over a much longer period. In this sense, the present study captures an early stage of development rather than a mature or stabilized form of professional change.

A further issue concerns sustainability without external support. During the study, the researcher provided individual coaching and facilitated peer interaction as part of the intervention. Whether the emerging community of practice would sustain itself once this external facilitation is withdrawn cannot be determined within the timeframe of the current research. Similarly, teacher self-reported confidence increased substantially after training, but confidence can decline if teachers later encounter persistent institutional or technical barriers.

Longitudinal follow-up studies conducted at six months, one year, or even later would therefore be essential for validating the sustainability of the observed changes. The short-term positive findings reported in this study should not be interpreted as evidence of lasting transformation without longer-term investigation.

4.3.3. Measurement Limitations

A first measurement-related limitation concerns observer subjectivity. Although the observation checklist provided structure to the observation process, judgments about whether a lesson demonstrated a high, moderate, or limited degree of interaction or pedagogical effectiveness still involved researcher interpretation. Since a single researcher conducted all observations, inter-rater reliability checks could not be implemented. Potential observer bias

therefore cannot be entirely excluded, particularly in the post-training phase where awareness of the intervention's goals might unconsciously influence interpretation.

A second limitation concerns self-report data. Questionnaire responses and feedback related to confidence, perceived progress, and satisfaction relied on teachers' own accounts. As with many intervention studies, social desirability bias remains possible: participants may have reported greater confidence than they actually felt, or may have overstated change out of gratitude for the training or a desire to appear professionally competent. Although the study attempted to reduce this possibility by ensuring confidentiality and by presenting feedback as a means of improving the programme, some degree of residual bias may still be present.

A third limitation is the absence of direct student outcome data. The study measured teacher practice and teacher perception, but it did not directly assess whether the observed improvements in teaching translated into measurable gains in student learning, engagement, or satisfaction. Since student learning remains the ultimate educational outcome of interest, the lack of student-level evidence means that the study can only make indirect claims about the intervention's broader pedagogical impact.

Future research should therefore incorporate student outcome measures in order to examine more fully the chain of causation linking teacher professional development to improved teaching practice and, ultimately, to enhanced student learning.

4.3.4. External Validity and Generalizability Boundaries

The external validity of the study is also limited by the scope and context of the sample. Participants came primarily from universities located in northern and relatively more urban regions of Algeria. Rural institutions, more resource-constrained campuses, and universities in less-developed areas may face different technological, institutional, and pedagogical barriers,

and may not benefit equally from the same professional development model. The sample therefore does not represent the full diversity of Algerian higher education institutions.

The study was also conducted within Algeria's specific linguistic and cultural context, particularly at a time when national policy has placed increasing emphasis on English in higher education. The receptiveness to online ESP professional development, the availability of institutional support, and the broader policy environment may differ significantly in other MENA countries or non-Arab contexts.

Participant homogeneity constitutes an additional limitation. All participants were tertiary-level instructors with university education and professional status within higher education. The model may therefore require significant adaptation for secondary school teachers, vocational instructors, or workplace trainers operating under different institutional conditions and with different professional backgrounds. Similarly, while the study treated the ESP teacher group as a single professional category, the reality is more complex: some ESP teachers are language specialists, while others may be subject-matter teachers required to teach English. Their training needs may differ in important ways, and the present sample did not explicitly stratify these categories.

The findings are therefore most confidently applicable to urban Algerian universities with moderately motivated, tertiary-educated ESP teachers and a moderate level of digital infrastructure. Broader application to other contexts should be approached cautiously and should be preceded by local needs analysis and pilot testing. In addition, because the study focused specifically on English for Specific Purposes, the findings may not transfer directly to General English as a Foreign Language context, even though some implications regarding online pedagogy, technology integration, and teacher professional development may still be relevant.

4.3.5. Time

Time remained a determining factor in the execution and analysis of the research project. The training sessions were initially planned to take place over six consecutive weeks, with two-hour sessions scheduled each Saturday. However, due to participants' academic workloads, personal obligations, and occasional institutional disruptions, several sessions were delayed or rescheduled. In some cases, weeks passed between training phases in order to accommodate participant availability. These irregularities affected the continuity and cohesion of the learning experience and required the researcher to adapt the materials and sustain participant engagement over a longer and less predictable timeline than originally planned.

Furthermore, the overall timeline of the research was constrained by the academic calendar. The training, data collection, and analysis had to be completed within a limited semester-based framework, which restricted the possibility of conducting follow-up activities or longitudinal observation. Although the implementation period was sufficient for measuring initial impact, it did not allow for a more extended examination of lasting pedagogical transformation or the consolidation of new teaching practices over time.

It is also important to note that the transferability of the findings is shaped by the temporal and institutional realities of Algerian higher education. The sector is currently undergoing important digital and linguistic shifts, and the conditions under which the study was conducted may continue to evolve. Even within Algeria, the situation in relatively well-resourced universities may differ from that in smaller or more remote institutions. These contextual and temporal conditions should therefore be taken into account when interpreting the findings or considering wider application.

While this study provides important evidence regarding the professional development of ESP teachers for online pedagogy, it is not without constraints. Acknowledging these

limitations is essential for contextualizing the findings and for guiding future research toward more refined and broader investigations. Despite these limitations, the study remains a useful starting point, and the insights gained are still valuable when interpreted with appropriate caution.

4.4. Recommendations

The recommendations presented in this section are organized with explicit attention to the scope of the study's evidence. Some recommendations emerge directly from the data collected during the needs analysis, the training intervention, the classroom observations, and participant feedback. These can be treated as evidence-informed implications of the present study. Other recommendations are broader and more prospective in nature. Although they are consistent with the literature and the wider policy context, they extend beyond the immediate findings of this small-scale intervention and should therefore be regarded as proposals for piloting, institutional experimentation, or further research rather than as conclusively validated outcomes.

4.4.1. Recommendations for Policymakers and Program Designers

Establish a National Framework for Continuous PD

Education authorities (the Ministry of Higher Education and university leadership) should institute a formal continuous professional development framework for higher education instructors that specifically includes digital pedagogy. This would entail mandating regular training hours for faculty and embedding PD into the academic calendar. By making ongoing training an integral part of a teacher's duties (rather than an optional add-on), institutions signal the importance of teaching excellence. Such a framework should be supported with incentives – for example, linking completion of PD programs with professional advancement,

certification, or recognition. A national or institutional policy could require all new faculty (and especially those teaching ESP or using English as medium) to undergo training in online teaching methodologies as part of their orientation, and for existing faculty to update their skills periodically. This approach responds to the identified gap in Algeria where professional development was previously left to individual initiative. It also aligns with recent strategic directives: Algeria's *Digital Master Plan (SDN 2022–2025)* (**check appendix 15**) envisions “Digital technology to support teacher training” as a priority axis, including programs for teacher pedagogy training and workshops. Making PD compulsory and structured is a concrete step to operationalize that vision.

Design Context-Specific and Needs-Based Training Programs

Any professional development program should be built on a thorough needs analysis of the target teachers and be tailored to the local context of teaching. In the case of ESP teachers, this means training content must address their dual challenge of language and content teaching in an online environment. Program designers should conduct baseline assessments or consultative workshops to pinpoint what teachers require (e.g. many in this study needed training on how to facilitate student interaction online, how to develop digital materials for specific disciplines, etc.). Using those insights, curricula can be developed that are immediately relevant – for instance, modules on online task design for ESP, using subject-specific digital resources, or strategies for student motivation in virtual classrooms. Off-the-shelf generic ICT trainings are unlikely to yield change; instead, contextualization is key. The training should incorporate examples and case studies drawn from Algerian universities (or similar contexts), so that teachers see practical applicability. Moreover, as recommended by our findings and supported by educational frameworks, programs should integrate the multiple knowledge domains teachers need. Adopting a comprehensive model such as TPACK in designing the

curriculum can ensure coverage of technological, pedagogical, and content knowledge in an integrated way. For example, rather than teaching a tool in isolation, a training session might show how to use a certain tool *pedagogically* to teach a particular type of ESP content. By aligning training design with authentic needs and a robust framework, we ensure the professional development is directly impactful.

Implement Ongoing Coaching and Peer Mentoring

One-off workshops alone are not sufficient to transform teaching practice. It is recommended to establish mentoring and peer support mechanisms as part of the PD programs. This could involve assigning experienced e-learning mentors or “digital pedagogy coaches” to ESP teachers undergoing training, who can provide individual guidance, observe their online classes, and give feedback over an extended period. Likewise, fostering peer mentoring circles where teachers regularly meet (physically or online) to discuss challenges, exchange tips, and reflect on their progress can reinforce learning from formal sessions. The action research demonstrated the power of collaborative learning – teachers learned as much from discussing with each other as from formal input. Policymakers should encourage institutions to create **Communities of Practice (CoP)** for ESP and language teachers focused on online teaching. These communities, possibly facilitated by a teaching and learning center, can maintain momentum by organizing monthly sharing sessions, creating an online forum or resource repository, and collectively problem-solving. Embedding mentorship and peer collaboration into PD echoes the recommendations of the UfM’s regional guide, which emphasizes capacity building through peer-learning, regular training, digital coaching, and mentoring. When teachers feel supported not just by instruction but by a community, they are more likely to implement changes and overcome obstacles.

Strengthen Infrastructure and Technical Support for Training

At the policy level, it is crucial to ensure that the necessary technological infrastructure and support systems are in place to enable effective training and subsequent teaching. This includes investing in stable internet connectivity on campuses, up-to-date software and platforms for both training simulations and real classes, and ensuring teachers have access to devices or computer labs during training sessions. Additionally, technical support staff (such as instructional technologists or IT helpdesk personnel) should be involved in training initiatives. They can assist teachers during workshops (e.g. troubleshooting issues as teachers practice on a learning platform) and remain available afterwards as teachers integrate new tools into their courses. A recommendation is for each university to have a dedicated e-learning support team that works in tandem with the PD program. Policymakers might allocate special funding or call for proposals to upgrade universities' digital infrastructure as part of teacher training enhancement. This recommendation aligns with the understanding that without addressing resource gaps, pedagogical training might not translate into practice. It is also in line with regional insights that stress improving infrastructure and resource access as part of any educational digital transformation. By coupling pedagogical training with the means to apply it, teachers will be empowered to implement innovations in their online ESP classes confidently.

Integrate Training with Quality Assurance and Recognition Systems

To ensure that the impact of professional development is sustained and valued, it should be tied into the institutions' quality assurance and faculty evaluation processes. It is recommended that universities develop indicators of teaching effectiveness in online settings (for example, criteria such as use of interactive methods, student feedback on teaching, etc.) and include them in regular faculty evaluations or course reviews. Teachers who have undergone PD in online pedagogy could then be assessed (formatively) on these aspects, not in a punitive way but to

identify further support needs and to acknowledge improvements. Moreover, exceptional efforts in implementing new pedagogies could be formally recognized through teaching excellence awards or public recognition at the institution. On the policy side, accrediting bodies or the Ministry could encourage universities to report on faculty development as part of accreditation or annual reviews, thereby creating an accountability mechanism. By linking training participation and outcomes with quality metrics, the system “closes the loop,” ensuring training is not just an isolated activity but part of a continuous improvement cycle. This recommendation ties into the idea of accreditation of digital education practices highlighted in the UfM report 2025 (e.g., establishing evaluation systems for digital education). It ensures that professional development for online teaching becomes an integral component of what is considered a quality higher education provision in Algeria.

Encourage Regional and International Collaboration in Training

Given that the challenges of digital transformation and ESP teaching are not unique to one institution, it is beneficial to leverage regional initiatives and partnerships. Policymakers and program designers should take advantage of platforms like the UfM-UOC Mediterranean Digital Education Initiative to exchange expertise, training content, and even jointly organize workshops. For example, Algerian universities could partner with institutions in other Mediterranean countries for virtual training seminars or invite experts through UfM networks. This study’s outcomes have already fed into a regional guidebook (discussed in the next section), exemplifying how local experiences can inform broader strategies. Building on that, a recommendation is to institutionalize channels for such collaboration – perhaps by creating a Mediterranean network of ESP and e-learning educators under the UfM’s umbrella, where regular webinars or conferences are held.

On a smaller scale, neighbouring universities within Algeria (or within the Maghreb) could pool resources to co-develop ESP online teaching resources or share online modules, thereby reducing individual burden and fostering consistency in quality. This collaborative approach is supported by the guidebook's aim to "*foster collaboration and guide common strategies*" across institutions in tackling digital education challenges. By looking outward and working together, Algerian higher education can accelerate its professional development efforts and stay abreast of global best practices.

In implementing these recommendations, it is important to maintain a feedback loop – continuously monitor and research the effectiveness of new training policies and programs. The spirit of action research – plan, act, observe, reflect – can be scaled up: pilot new initiatives, gather feedback from teachers and students, and refine accordingly. The recommendations above are mutually reinforcing; together, they outline a systemic approach to teacher development. If adopted, they would not only improve the capabilities of ESP teachers for online pedagogy but also contribute to a culture where teaching excellence and innovation are actively cultivated. This is essential for Algerian universities to produce graduates with the language and digital skills needed in today's economy, thereby fulfilling a broader educational and economic mission.

Integrating Artificial Intelligence into ESP Professional Development Frameworks

Considering rapid advancements in educational technology, policymakers and program designers should explicitly incorporate artificial intelligence (AI) literacy and tools into national frameworks for ESP teacher professional development. AI-driven platforms, such as intelligent tutoring systems and content generators, have shown promise in enhancing teacher training by automating routine tasks, providing personalized feedback, and fostering data-driven pedagogical decisions. For Algerian higher education institutions, where infrastructure

constraints persist, AI can support the creation of low-bandwidth, context-sensitive resources such as discipline-specific glossaries or quizzes directly aligned with TPACK principles.

Recent empirical research conducted among 39 university EFL teachers across Algerian institutions reveals a stark gap in AI integration within professional development programs—a finding that directly reinforces the policy recommendations outlined above. Despite 71.8% of participants reporting regular use of AI tools (primarily ChatGPT for materials preparation and student activities), 53.8% lacked full understanding of AI's capabilities and limitations, and 56.4% had received no training on ethical issues such as content generation biases or academic integrity concerns. This mirrors the pre-training digital proficiency deficits identified in the current study's needs analysis, where Algerian ESP teachers struggled with online pedagogy adaptation.

Selougui (2025) further documents that 66.7% of these EFL instructors had no guidance training for students using AI in assignments, with 38.4% explicitly not advising on tools like ChatGPT for master's dissertation structuring due to plagiarism fears. Such ad-hoc adoption without structured PD risks perpetuating inequities, as teachers default to familiar (but potentially ineffective) applications without critical evaluation protocols. Policymakers must therefore mandate AI literacy modules in the Ministry of Higher Education's in-service training, explicitly addressing Selougui's call to "review professional development programs" for ethical AI use, tool evaluation, and student guidance.

This evidence-based approach aligns with Cukurova et al. (2024)'s framework for teacher AI readiness ethics promotion, system improvement through error reporting, and alignment with pedagogical values—tailored to Algeria's EMI policy shifts. By institutionalizing such training, the national ESP PD framework can transform observed gaps

into strengths, ensuring teachers not only use AI but guide learners responsibly toward professional discourse competence.

A dedicated module on AI integration could be mandated within the proposed national online ESP PD scheme, emphasizing ethical guidelines to mitigate risks like algorithmic bias or over-reliance. Recent Algerian-focused research underscores this need, advocating AI as a supplement to formal training amid limited institutional support, enabling teachers to design syllabi more efficiently while prioritizing human oversight in content validation. By allocating ministry funding for accessible AI tools (e.g., multilingual models supporting Arabic-French English interfaces), policymakers can ensure equitable access, bridging gaps in teacher digital proficiency and sustaining long-term improvements in online ESP delivery. This policy-level innovation would not only address immediate post-pandemic needs but also position Algerian ESP education as forward-thinking, preparing teachers for blended learning environments where AI augments, rather than replaces, reflective practice.

4.4.2. Recommendations for Further Research Longitudinal Studies of Teacher

Development

Future research should prioritize longitudinal investigations into the sustained impact of digital training programs on ESP teachers' instructional practices. While this study demonstrated positive short-term outcomes in terms of digital competence and pedagogical innovation, it remains essential to explore how these competencies evolve over extended periods. Tracking teacher performance across multiple academic semesters would provide valuable insight into the degree to which initial training leads to enduring changes in classroom behavior, lesson planning, student interaction, and assessment design. Moreover, longitudinal studies could help identify factors that either support or hinder the retention and expansion of

digital skills, such as access to ongoing support, institutional culture, and peer collaboration networks.

Comparative Institutional Research

Comparative research across Algerian universities or between Algerian and other MENA-region institutions offers an opportunity to better understand how institutional context shapes the success of professional development initiatives. Variations in infrastructure, administrative support, leadership engagement, and teacher workload policies may significantly influence training uptake and outcomes. By examining institutional differences, researchers can identify which governance models, resource allocations, or support mechanisms are most conducive to scaling effective online pedagogy. Furthermore, such studies could foster cross-institutional dialogue and policy learning, enabling the development of more harmonized and evidence-based strategies for ESP teacher training at the national or regional level.

Student-Centered Research

While this study focused on teacher development, future research should give voice to learners by exploring their experiences in digitally mediated ESP classrooms. Understanding how students engage with online language instruction especially when delivered by newly trained teachers can shed light on the pedagogical effectiveness and accessibility of such courses. Attention should be paid to student satisfaction, motivation, and perceived learning gains. In addition, research could investigate how various student subgroups (e.g., STEM vs. humanities students, undergraduates vs. postgraduates) respond differently to digitally enhanced ESP instruction, helping educators adapt content and strategies to diverse learner profiles.

Technology-Enhanced Language Learning

The rapid advancement of educational technologies calls for dedicated research into their integration within ESP teaching. Future studies should examine how tools such as learning analytics dashboards, AI-powered writing assistants, mobile language learning apps, and gamified assessment platforms can enrich ESP instruction. Of particular interest is the role of such technologies in personalizing instruction based on learners' disciplinary needs and professional aspirations. By exploring the affordances and challenges of these tools in real classroom settings, researchers can generate actionable insights into how digital innovation can support language development, learner autonomy, and career-oriented communication skills in ESP contexts.

4.4.3. Recommendations for Teachers Themselves: Building Self-Directed Professional Growth

While institutional support and policy-level recommendations are essential for scaling professional development, individual teachers also play a critical role in their own development. This study demonstrated that teachers who took an active, reflective stance toward their own growth who asked questions about their practice, engaged in structured self-assessment, and sought peer learning opportunities—showed deeper and more sustained development than those who passively waited for external input. This section offers teachers practical strategies for continuing to grow after formal training ends, building on capacities developed during the intervention and cultivating dispositions of continuous improvement.

4.4.3.1. Structured Self-Reflection as an Ongoing Practice

Reflection emerged as a powerful mechanism through which experience is converted into learning. During the formal training, teachers engaged in structured reflection through journaling, peer discussion, and mentoring conversations. However, structured reflection should not end when formal training concludes; rather, it should become an ongoing practice habit that sustains and deepens professional development.

The principle underlying this strategy is simple: teaching experience does not automatically translate into learning. A teacher might teach a lesson, go home, and never think critically about what happened. Alternatively, the same teacher might spend 15 minutes reflecting on key questions about the lesson, extracting insights that inform the next iteration. The difference is reflection.

4.4.3.1.1. Practical Tools for Self-Reflection

Teaching Reflection Journal: After each online ESP lesson, spend 10-15 minutes writing reflections addressing these key questions:

- What went well? Identify moments when students were particularly engaged, when a learning activity succeeded, when communication was clear. Also identify why these things worked: What did you do? What did students do? What was the context?
- What surprised me? Note unexpected outcomes. Did a student ask an insightful question you hadn't anticipated? Did a strategy fall flat when you expected it to work? Did the student engagement level increase in an unexpected area?
- What question am I sitting with? What pedagogical or technical challenge are you thinking about? What would you like to understand better? What experiment might you try next time?
- What small change will I try next time? Don't commit to wholesale lesson redesign. Identify one small, specific change. "Next time I teach this lesson, I will..." This focuses on concrete, manageable improvement.

Journaling creates a record of your development over time. Looking back at journals from months prior, you see your own growth. It also externalizes your thinking, making implicit learning explicit. When you struggle to articulate what worked and why, you have encountered a gap in your understanding precisely where further learning is needed.

4.4.3.1.2. Teaching Portfolio

Select one lesson that you teach regularly (e.g., a technical vocabulary lesson, a case study discussion activity, a presentation skills task). Over the course of a year or semester, document the evolution of this lesson:

- Save the original version (before professional development)
- After each iteration, note what changes you made and why
- Include student feedback or evidence of engagement
- Collect student work samples showing growth in performance
- Write periodic reflections on how the lesson has evolved and what you've learned

This portfolio approach shows development over time and provides evidence for yourself and others about your commitment to continuous improvement. It can also serve as a powerful artifact when discussing your teaching with mentors or colleagues.

4.4.3.1.3. Reflection on Student Engagement and Learning:

Beyond reflecting on your own actions, reflect on student outcomes:

- Did students participate more in this lesson than in my previous lessons?
- What evidence do I have of learning? (Questions asked, quality of discussion, assessment results, student feedback)
- Which students engaged deeply and which seemed disengaged? What patterns do I notice?
- What might have contributed to different engagement levels?
- What would I change if teaching this again?

Focusing on student outcomes, not just your own teaching actions, maintains alignment with the ultimate goal: student learning.

4.4.3.2. Peer Learning and Observation as Professional Community

Teaching can be isolating, especially in online environments where there is less spontaneous colleague interaction. Deliberately cultivating peer learning relationships creates community and accelerates development through shared problem-solving and mutual inspiration.

4.4.3.2.1. Approaches to Peer Learning

- Find a Peer Buddy: Identify one or two other ESP teachers (ideally with whom you have established rapport) and propose a simple partnership structure:
- Monthly meetings (30-45 minutes, in-person or virtual): Discuss one challenge or question you're both facing. Brainstorm together. Share resources or strategies you've tried. Examples of topics: "How do I get students to use English in our discipline-specific chat discussions?" or "What's the best way to structure breakout room activities for medical English?"
- Lesson plan exchange: Periodically share your lesson plans with your buddy, explain your thinking, and get feedback. Your buddy might ask: "What's your goal with this activity?" or "How will you know if students achieved this objective?" This external perspective often reveals assumptions or gaps in planning.
- Record sharing and feedback : If comfortable, record a lesson and share it with your buddy. Your buddy watches and provides feedback, answering: "What did you notice about student engagement? What strategy from training did you see implemented? What would you suggest trying next?" This mirrors the mentoring that occurred during the formal training but sustains it within your peer network.
- Resource sharing: Create a shared drive where ESP teachers post lesson materials, activity ideas, assessment tools, and digital resources. Annotate resources with notes like "Works well for B2 level," "Students found this engaging," "Requires good internet connection."

- Discussion forum (online or email): Set up a low-barrier communication channel where teachers share ideas, ask questions, and support each other.

Peer learning combats isolation, accelerates learning from peers' experience and mistakes, normalizes challenges, creates accountability for continued growth, and builds a professional culture where teaching excellence is valued and discussed.

4.4.3.3. Building and Sustaining Your Support Network

Professional growth thrives in community and withers in isolation. Beyond formal institutional support structures, you can deliberately build a personal support network of colleagues, mentors, and professional communities who sustain your development.

4.4.3.3.1. Components of a Support Network

- Local peer network: Your department colleagues, the peer buddy/community described above. These are people who know your context, your students, your institution, and who you interact with regularly. They are invaluable for practical problem-solving and immediate support.

- Professional online communities: Beyond your local setting, connect with broader communities of ESP and language teaching professionals:

- TESOL International Association and ESP Interest Section: TESOL holds annual conferences, maintains online forums, and offers webinars on a range of topics. Membership connects you to thousands of English teaching professionals globally. Many discussions occur online, making participation feasible even for busy teachers.

- IATEFL (International Association of Teachers of English as a Foreign Language): Similar to TESOL, with regional chapters and online communities.

- LinkedIn groups for language teachers: Search "TEFL," "TESOL," or "ESP teaching." These communities combat isolation, expose you to diverse perspectives and innovative practices

from other contexts, provide an audience for sharing your own innovations, and sustain motivation through connection with others doing similar work.

4.4.3.4. Leveraging AI Tools for Self-Directed Materials Development and Reflection

ESP teachers can harness AI as a personal "co-pilot" for self-directed growth, particularly in generating and refining online materials tailored to specific disciplines. Tools like ChatGPT or domain-specific generators enable rapid prototyping of authentic tasks such as engineering case studies or medical role-plays allowing teachers to iterate based on classroom feedback within action research cycles. This aligns with findings from EFL contexts, where AI reduces workload on routine design, freeing cognitive space for pedagogical innovation and student engagement.

Teachers must treat AI outputs as drafts requiring adaptation for cultural relevance, accuracy, and proficiency levels, fostering the reflective habits central to sustainable PD. Algerian ESP practitioners, often facing resource scarcity, stand to benefit from such tools, as evidenced by studies showing AI's role in overcoming syllabus design challenges without formal training. By documenting AI-assisted trials in personal journals or departmental CoPs, teachers build a portfolio of evidence-based practices, transforming technology from a barrier into an enabler of autonomy.

While institutional support is essential, you also have significant agency in your own professional growth. By engaging in structured reflection, building peer learning relationships, experimenting deliberately with new approaches, sustaining a support network, and cultivating a researcher's curiosity about your own teaching, you can ensure that your professional development continues long after formal training concludes. Teachers who take this active stance toward their own growth find teaching more intellectually engaging, develop greater expertise over time, and ultimately provide better learning experiences for their student's sustainable professional development does not happen by chance. It results from deliberate

attention to the conditions that support sustained change: ongoing support structures, institutional recognition, clear expectations, protected time, and infrastructure. Institutions that build these conditions from the start of professional development initiatives are substantially more likely to see initial training investments result in lasting improvement. Those that treat sustainability as an afterthought typically see change erode within 2-3 years. For organizations genuinely committed to improving teaching quality, the question is not whether to invest in sustainability infrastructure, but how to do so efficiently and effectively.

4.4.4. Recommendation for Online ESP Teacher Development

In the digital era, online platforms and technologies have unlocked new possibilities for ESP teacher training and ongoing development. A significant innovation is the creation of virtual communities of practice for ESP professionals. Through social media groups, online forums, and webinars hosted by organizations like TESOL's ESP Interest Section, teachers worldwide are now able to share resources, discuss challenges, and mentor each other virtually. This peer-to-peer learning is critical in a niche field like ESP, where a single institution might have only one or two specialists. Research indicates that such knowledge-sharing networks foster a collaborative climate that enhances teachers' reflective practice and agency. For example, an online network of ESP teachers in Iran studied by Farahani and Parhamnia (2021) showed that teachers' frequency of exchanging ideas (via a dedicated platform) predicted their sense of professional empowerment and willingness to innovate in their classes. Likewise, global webinars – especially prominent during and after the COVID-19 pandemic – have emerged as a tool to disseminate innovations in ESP pedagogy quickly. Teachers from different countries have reported implementing ideas gained from webinars (e.g. on using specific mobile apps for ESP vocabulary or new simulation techniques) into their teaching, illustrating how online PD accelerates the transfer of cutting-edge practices across borders.

Another area of innovation is the use of adaptive learning technologies and digital tools in ESP teacher development. Modern online training courses are increasingly leveraging adaptive platforms that tailor content to the individual teacher's profile. For instance, an ESP teacher might take an initial diagnostic quiz online, and the platform can then recommend specific modules (such as "ESP Curriculum Design" or "Using Corpora for ESP") based on the gaps identified. While still emerging, such adaptive systems draw on the same principles used in adaptive language learning for students. They offer a personalized professional learning path, enabling teachers to progress at their own pace and focus on areas most relevant to their teaching context. Additionally, digital badges and micro-credentials are being introduced in some ESP teacher training programs to recognize specific skills (e.g., a badge in "Needs Analysis Expertise" or "ESP e-Assessment"), which teachers can earn through completing online coursework and practical assignments. This granular certification encourages teachers to pursue continuous upskilling in a flexible manner, and the badges can be shared on professional networks to highlight one's qualifications in ESP.

Crucially, technology is not only the medium but also often the subject of ESP teacher training innovations. As the previous sections noted, ESP practitioners need competence in using technology for things like online teaching, materials development, and assessment. Recent training courses have started to include hands-on practice with these tools. For example, an online teacher development course might train participants in using learning management systems to create ESP modules, or how to design digital formative assessments tailored to specific purposes (such as a business email writing quiz or a virtual lab report evaluation for science ESP). The importance of this was underscored by Rachmawati et al. (2024), who found that many ESP teachers struggled with online assessment during remote teaching due to a lack of training and clear standards. In response, new guidelines and exemplars for digital ESP assessment are being shared through online workshops, giving teachers templates and tools

(for instance, how to use Google Forms or specialized software to simulate industry-specific tasks).

Another innovation is the incorporation of simulated environments and educational games in teacher training. Some programs use platforms like Second Life or scenario-based simulation software to let teachers experience what it's like to facilitate an ESP task in a virtual environment, such as a business meeting or medical emergency scenario. This not only builds teachers' technological pedagogical skills but also helps them visualize how to bring realistic simulations into their own classrooms. Research by Synekop (2020) demonstrated the efficacy of a WebQuest-based training task for ESP teachers – Ukrainian trainee teachers were guided to create WebQuests as a form of differentiated ESP instruction, which in turn improved their students' professional communication skills when implemented. The study concluded that increasing teachers' TPACK (Technological Pedagogical Content Knowledge) in such a way leads to more creative and effective ESP teaching practices, though it also noted that continuous technology literacy development is needed for teachers to fully exploit these tools.

In the realm of online ESP teacher development, one can also observe a push towards research-informed online content. Developers of online courses are collaborating with ESP researchers to embed the latest findings directly into e-learning modules. For example, if new research comes out on an effective strategy for teaching English for nursing, an online PD course can rapidly include a unit on that strategy, complete with demonstrations and interactive practice for the teacher. This agility is a benefit of online platforms – they can be updated and scaled much faster than traditional face-to-face workshops.

Finally, mentorship and coaching are being reimaged in virtual formats. Some innovative programs pair novice ESP teachers with experienced mentors through video calls and online classroom observations. The mentor can observe a recorded teaching session and then provide feedback via an online meeting, allowing real-time mentoring despite geographic

distances. This has been piloted in ESP teacher induction courses in Latin America with promising results, as new teachers reported feeling far less isolated and more competent after receiving remote coaching from experts abroad (Pesina, 2025).

Overall, innovations in online ESP teacher development are making professional learning more accessible, customized, and directly applicable. By harnessing technology – from adaptive learning systems to virtual simulations – and building global communities, these approaches help overcome some long-standing limitations in ESP teacher training (such as geographic isolation and lack of resources). Importantly, research confirms that while technology can facilitate many aspects of ESP teaching and PD, it does not diminish the need for human collaboration and support. Kakoulli Constantinou and Papadima-Sophocleous (2020) found that technology use significantly aids ESP teachers in tasks like course design, materials development, and assessment, but they also stress that teachers still require ongoing development in tech literacy, plus collaboration with domain experts and mentoring, to fully realize these benefits.

The future of ESP teacher development will likely be a hybrid one: blending online and offline learning opportunities, combining technological tools with rich human interaction, and always guided by research-based insights into effective ESP teaching. This blended, innovative approach promises to better prepare ESP educators to meet the evolving demands of their learners and the specific purposes for which they are learning English.

4.4.4.1. AI-Enhanced Strategies for Online Engagement and Assessment

Within online ESP teacher development, AI offers targeted enhancements for interactive pedagogy, such as generating adaptive quizzes, chatbots for conversational practice, or automated feedback on student submissions. These tools promote student-centered learning by simulating professional scenarios (e.g., business negotiations or technical reports), directly addressing pre-training gaps in digital proficiency observed in this study. Global ESP research

confirms AI's efficacy in creating personalized, domain-specific content that boosts vocabulary acquisition and communicative competence.

For Algerian contexts, integration should emphasize hybrid use: AI for initial content creation, followed by teacher-led customization to ensure alignment with local EMI policies and connectivity realities. Training must include safeguards against pitfalls like overreliance, which could undermine critical thinking echoing concerns in recent ESP pedagogy reviews. Ultimately, AI empowers teachers to elevate online sessions from lecture-heavy to collaborative, sustaining the intervention's gains in engagement and outcomes.

4.4.4.2. AI-Assisted ESP Course Design: Practical Applications from Corpus and Genre Analysis

Anthony (2025) provides a comprehensive blueprint for AI-assisted ESP course design across the four pillars needs analysis, objectives, materials/methods, and evaluation—directly applicable to Algerian online pedagogy training. For needs analysis, AI tools like Gemini or NotebookLM can generate stakeholder surveys and synthesize free-text responses, collating learner weaknesses (e.g., vocabulary gaps in technical genres) into prioritized lists faster than manual coding. For materials creation, Anthony demonstrates AI's role in data-driven learning (DDL) enhancements: tools like AntConc's ChatAI simplify corpus queries, or masking noun phrases to reveal rhetorical structures. Algerian ESP teachers, often non-specialists in students' fields (e.g., engineering, medicine), could use Retrieval-Augmented Generation (RAG) systems like NotebookLM on uploaded discipline corpora to generate genre-aware tasks—e.g., abstracts or technical emails without domain expert consultations.

Evaluation benefits most dramatically: AI automates formative feedback on genre appropriacy (passive voice, hedging), scoring bulk outputs while flagging L1 transfer issues, as validated in Stewart et al. (2025). Selougui's (2025) finding that untrained Algerian EFL teachers cannot reliably guide AI use in student assessments. Training must emphasize human oversight

explaining AI, curating outputs, and fostering creativity to realize Anthony's vision of symbiotic AI-human ESP pedagogy.

4.5. Practical Innovations for Algerian Context

Recognizing the unique challenges and opportunities within this context, it introduces practical innovations at two distinct levels: systemic policy reforms and localized, teacher-led initiatives. These proposals aim to move beyond temporary fixes by establishing a National Framework for Online ESP Professional Development and fostering sustainable Action Research Cycles within university departments. The goal is to provide a structured yet flexible roadmap that empowers both institutions and practitioners to continuously enhance the quality of online ESP instruction.

4.5.1. Policy-Level Innovations: National Framework for Online ESP Professional Development

Algeria's 2023-2024 policy shift making English the first language of higher education and scientific research creates both opportunity and mandate for scaling effective online ESP professional development. Currently, the nation lacks a coherent national framework specifying competencies required for online ESP instruction, pathways for teacher development, or institutional accountability for professional learning.

4.5.1.1. Proposed National Online ESP Professional Development Framework

The Ministry of Higher Education and Scientific Research (MESRS) should establish a national competency framework and certification pathway for online ESP teachers. This framework should specify:

1. Core Competencies:

- Technological Competencies

- Platform management (Moodle, Teams, Zoom)
- Learning analytics interpretation
- Digital resource curation and adaptation
- Video recording, editing, and integration
- Assessment tool selection and deployment

2. Online Pedagogical Competencies

- Designing interactive asynchronous and synchronous learning experiences
- Facilitating participation and engagement in virtual environments
- Creating inclusive online learning spaces
- Providing meaningful feedback at distance
- Assessment and evaluation in online contexts

3. ESP-Specific Competencies

- Conducting targeted needs analysis
- Genre analysis and discipline-specific pedagogy
- Authentic task design aligned to professional communication
- Content expertise or collaborative relationships with disciplinary specialists
- Assessment of specialized communication competencies

4. Professional Competencies

- Reflective practice and continuous improvement
- Collaboration and mentorship
- Ethical use of technology and student data
- Cultural competence and inclusive pedagogy
- Evidence-based decision making

4.5.1.2. Certification Pathways:

Three-tier certification structure:

Level 1: Foundational Online ESP Teacher (completion of 40-hour training; one year teaching experience with online component; portfolio assessment)

Level 2: Advanced Online ESP Practitioner (additional 20 hours advanced training; demonstrated innovation in teaching; peer mentoring; research or published case study)

Level 3: Master Online ESP Educator (five years experience; institutional leadership role; contribution to teacher development; significant research or curriculum innovation contribution)

This tiered approach provides progression pathways, incentivizes continuous learning, and recognizes expertise levels.

4.5.1.3. Implementation Timeline:

Year 1 (2026): Framework development through MESRS working group including universities, teaching centers, and international experts

Year 2 (2027): Pilot certification in 3-5 universities

Year 3 (2028): National rollout; incorporation into institutional accreditation standards

Year 4+ (2029+): Annual certification cohorts; continuous revision based on evidence

4.5.1.4. Expected Outcomes:

- National consistency in online ESP teacher qualifications
- Clear career advancement pathways for educators
- Institutional accountability for faculty professional development
- Alignment with international standards (ISTE, TESOL, European frameworks)

4.5.2. Teacher-Led Innovations: Action Research Cycles in Departments

The most sustainable innovation occurs when teachers themselves become agents of professional development within their departments. This requires shifting from top-down training to teacher-led, collaborative inquiry cycles.

Departmental Action Research Model

Each department (e.g, Engineering Department offering technical English) implements a cyclical process of improvement:

Phase 1: Needs Identification

- Department meeting reviewing current online ESP teaching practices
- Data collection: brief needs analysis survey of faculty teaching online ESP, student feedback on online instruction, challenges identified
- Analysis: What are our biggest gaps or challenges?

Phase 2: Collaborative Learning

- Department selects one or two priority development areas (e.g., "increasing student engagement in asynchronous forums" or "designing better formative assessments online")
- Hosts visiting expert, organizes workshop, or engages external consultant for focused training
- Alternatively, one faculty member studies the topic and leads department learning (reading research, trying new strategies, reporting back)

Phase 3: Implementation and Experimentation

- Faculty implement new strategies in their online ESP courses
- Continue regular teaching; experimentation is integrated, not additional burden
- Collect minimal data: student participation patterns, assignment quality, brief student feedback

Phase 4: Reflection and Sharing

- Department meeting where faculty share outcomes, challenges, and learning
- Reflection on effectiveness using collected data
- Celebrate successes; discuss adaptations for next cycle

Phase 5: Institutionalization

- Identify practices worth retaining and scaling
- Develop shared resources (lesson templates, assessment rubrics, instructional guides)
- Integrate innovations into department curriculum and teaching guidelines

This cycle repeats annually, with each year building on previous learning.

4.5.3. Mandatory Foundational AI Training for ESP Teachers

The rapid advancement of artificial intelligence (AI) technologies has fundamentally transformed the landscape of English for Specific Purposes (ESP) instruction. While AI tools such as ChatGPT, Gemini and Grok, language learning platforms powered by machine learning, and automated assessment systems are becoming increasingly prevalent in educational contexts, many ESP teachers lack the foundational knowledge necessary to effectively and ethically integrate these technologies into their pedagogical practice. A mandatory foundational AI training program represents a critical investment in teacher professional development, ensuring that educators are equipped with the competencies required to harness AI's potential while maintaining pedagogical integrity and addressing ethical considerations.

The integration of AI into ESP teaching transcends mere technical proficiency; it demands a nuanced understanding of how artificial intelligence can enhance student learning outcomes, personalize instruction, and support diverse learning needs while mitigating risks associated with algorithmic bias, data privacy, and over-reliance on automated systems. Without systematic, mandatory training, the adoption of AI technologies in ESP classrooms

remains inconsistent, potentially reinforcing instructional inequities and limiting the profession's capacity to prepare students for an AI-mediated workplace

Generative AI for Educators with Gemini Free Course from Google

Generative AI for Educators with Gemini offers ESP teachers a practical, free training program to integrate Google's Gemini AI into language instruction. This self-paced course equips educators with foundational skills for using generative AI responsibly in classrooms.

The Course is Developed by Google AI experts, the 2-hour course requires no prior experience and targets middle/high school teachers across subjects, including ESP. Participants learn generative AI basics—what it is, opportunities, limitations, and ethical use through hands-on practice with Gemini and NotebookLM. Upon completion, teachers earn a certificate for professional development credit, depending on institutional policies (Google, 2025).

The program focuses on three pillars tailored to ESP teaching needs.

- Save time on tasks: Draft emails, newsletters, lesson plans, and administrative correspondence using conversational prompts.
- Personalize instruction: Adapt materials for diverse learners, re-level texts for reading proficiency, create vocabulary lists, and differentiate ESP content by industry or skill level.
- Enhance lessons creatively: Generate quizzes, rubrics, practice materials, engaging activities, and multimedia resources like audio overviews for pronunciation or business scenarios.

For ESP teachers, Gemini excels in domain-specific tasks like generating technical reports, role-play dialogues for aviation/medicine/business English, or customized assessments aligned to CEFR levels. Tools like NotebookLM create podcasts from ESP texts for listening practice, while Gemini Canvas supports interactive language exercises. Recent 2026 updates integrate

Gemini with Google Classroom for real-time assignment drafting and student progress summaries.

Mandate this training as a prerequisite for ESP faculty, allocating 2-4 hours during professional development sessions. Follow with institution-wide Gemini access via Google Workspace for Education, including multilingual support for non-native English instructors. Track impact through pre/post surveys on AI confidence and classroom application rates.

Mandatory foundational AI training for ESP teachers represents a strategic investment in professional development that transcends any single institution or context. By systematically equipping educators with the competencies to understand, evaluate, and ethically integrate artificial intelligence into pedagogical practice, educational systems signal their commitment to preparing both teachers and students for meaningful participation in an increasingly AI-mediated world. This training must be comprehensive, addressing foundational knowledge, ethical reasoning, practical skills, and continuous learning capabilities. When implemented with institutional support, thoughtful change management, and genuine commitment to teacher agency, mandatory AI training transforms potential anxieties about technological change into opportunities for pedagogical innovation and professional growth.

Grow with Google

Generative AI for Educators with Gemini

As a teacher, we know your time is valuable and student needs are broad. With Generative AI for Educators with Gemini, you'll learn how to use generative AI tools (like Gemini and NotebookLM) to help you save time on everyday tasks, personalize instruction, enhance lessons and activities in creative ways, and more.

[Get started](#)

Flexible AI training designed for teachers

This self-paced course fits into a teacher's busy schedule with flexibility in mind. It offers hands-on, practical experience for teachers across disciplines. Of educators who completed the course:

83% expect to save 2hr+ a week using genAI tools¹	74% felt confident in their ability to use genAI in the classroom²
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Diagram 4. 1. Generative AI for Educators with Gemini

Google. (2025). Generative AI for Educators with Gemini. Grow with Google.

<https://grow.google/ai-for-educators/>

4.6. Final Thoughts

One of the distinguishing features of this doctoral research has been its active linkage with regional digital education efforts, specifically through a nine-month internship with the Union for the Mediterranean (UfM) at the Higher Education and Research Division and contributions to the UfM-UOC Mediterranean Digital Education Initiative. This initiative, a

collaboration between the UfM and the Open University of Catalonia (UOC), was launched in 2024 to support higher education institutions in the region in their digital transformation journey. It comprised a series of training workshops for university leaders and staff, culminating in the development of a comprehensive guidebook on enhancing digital education in the Mediterranean. The research presented in this thesis both benefited from and added value to this high-profile regional endeavour.

During the internship, the researcher was directly involved in the development of the UfM-UOC guidebook, titled *“Enhancing Digital Education in the Mediterranean”*. This guidebook (published in late 2024) serves as a practical manual for institutions and decision-makers across UfM member countries, outlining strategies, best practices, and recommendations for implementing digital education at scale. The researcher’s contributions drew upon the insights and data generated from the Algerian ESP context, ensuring that the guidebook’s content was informed by on-the-ground realities. For instance, the challenges identified in the study – such as disparities in infrastructure and the need for teacher capacity building – were echoed in the regional discussion, and specific examples from the Algerian university context were provided to the UOC team. This helped paint a nuanced picture of the southern Mediterranean context, illustrating that while technology adoption is a common goal, starting conditions vary and thus solutions must be tailored.

The study’s findings on effective professional development methodologies fed into the sections of the guidebook dealing with capacity building and faculty training. The emphasis on action research and peer learning from this thesis reinforced the guidebook’s recommendation that capacity building be an ongoing, collaborative process rather than one-off training. In fact, the UfM guidebook explicitly recommends solutions such as *“regular training, digital coaching, and mentoring”* for educators, and the evidence from this thesis provided a concrete

case of how those practices can be implemented and with what impact. The researcher assisted in framing guidelines that encourage universities to adopt mentorship programs and foster communities of practice – drawing a direct line from our local intervention to regional policy advice.

Moreover, the internship facilitated valuable knowledge exchange. The researcher participated in workshops and webinars under the UfM-UOC initiative, presenting preliminary findings of the study to an audience of regional stakeholders. This not only validated the study's relevance beyond its immediate context but also allowed feedback from experts in other countries (e.g., educational technologists, policy makers) to be considered in our analysis. It exemplified a two-way contribution: the researcher provided content and lessons to the initiative, and conversely, the regional perspective enriched the interpretation of our results. For example, hearing about the experiences of institutions in other Mediterranean countries (like Tunisia, or Egypt) through UfM forums highlighted commonalities – such as the struggle to engage faculty in digital change and the need for strategic leadership – which helped generalize some implications of our study. It also highlighted success stories and innovative models from abroad, some of which have been cited in our thesis (for instance, awareness of Egypt's strategic plan and Spain's UniDigital initiative was raised during those exchanges, underscoring the importance of aligning any local initiative with global trends).

A notable aspect of the UfM-UOC guidebook is its stress on multi-level engagement: it targets not just teachers, but also senior academic leaders and administrators. In contributing to the guidebook, the researcher leveraged the study's insights to advocate for enabling conditions that leadership must ensure for teacher training to succeed. This aligns with one of the guidebook's primary goals, which is to “*foster collaboration and guide common strategies while tackling the challenges of digital transformation in higher education*”. The collaborative

spirit of the action research – bringing together teachers, administrators (where possible), and researchers – served as a microcosm of what the UfM hopes to achieve on a larger scale: cross-stakeholder collaboration for systemic change. By documenting and sharing this experience, the researcher was able to contribute a concrete example of collaborative change management to the guide’s narrative, possibly inspiring other institutions to adopt a similar participatory approach.

In terms of strategic relevance, the synergy between this research and the UfM initiative significantly amplifies the impact of the thesis. It situates the research within a Mediterranean-wide movement towards digital education reform. The UfM has been explicitly instrumental in promoting teacher training and digital literacy initiatives in the region, and the thesis contributed directly to that mission. For Algeria specifically, having representation in the UfM project via this research means that Algeria’s context and needs were voiced in a regional policy conversation. This is timely and important, given that Algerian higher education is undergoing reforms and increased openness to international cooperation. The researcher’s contribution to the UfM guidebook effectively translates the thesis outcomes into a policy-oriented format that can influence decision makers. For example, if university rectors or ministry officials in Algeria consult the UfM guidebook (as part of Mediterranean cooperation efforts), they will encounter recommendations and rationales that were derived from, among other sources, this very study – lending credence and urgency to the proposed changes.

4.7. Conclusion

This chapter has synthesized the findings of the study and considered their implications for ESP teacher professional development in online pedagogy within Algerian higher education. The evidence from the intervention suggests that targeted, context-sensitive training can contribute to improvements in digital proficiency, online pedagogical practices, and

teachers' confidence in virtual teaching environments. It also indicates that reflective practice and collegial exchange may support the consolidation of such development.

At the same time, the chapter has emphasized that these conclusions must be interpreted in light of the study's limitations, particularly the small sample size, the short duration of post-intervention measurement, and the restricted scope of generalization. For this reason, the broader proposals outlined in this chapter should be read as informed directions for future development rather than as definitive solutions. Even so, the study provides a useful starting point for institutions and researchers seeking to strengthen ESP teacher development in online pedagogy in ways that are responsive to Algerian realities.

GENERAL

CONCLUSION

GENERAL CONCLUSION

The present research titled “Improving ESP Teacher Professional Development for Online Pedagogy in Algerian Higher Education” has emerged as a timely response to the sweeping digital transformations in education, particularly in the wake of the COVID-19 pandemic. As Algeria advances its national agenda to strengthen the role of English in academia and scientific research, the capacity of ESP teachers to adapt their pedagogical strategies to online contexts has become an urgent necessity. This study was not only significant in addressing the critical gap in Algerian teacher training frameworks but also in aligning with international movements that advocate for competency-based, digitally enabled, and context-sensitive language education. By focusing on ESP teachers’ development for online pedagogy, the research contributes both locally and globally to the body of knowledge on professional learning, teacher adaptability, and educational reform in the Global South.

Across the four chapters of this thesis, the study methodically explored the theoretical, methodological, and empirical dimensions of the research problem. Chapter One provided a comprehensive literature review, highlighting the unique needs of ESP education, the theoretical underpinnings of professional development including TPACK and Communities of Practice, and the implications of online pedagogy in emerging educational contexts. This chapter established that while extensive research on teacher development exists in Western contexts, the ESP domain in resource-constrained, non-English-speaking countries remains underexplored a gap this research directly addresses.

Chapter Two detailed the research methodology, employing an action research design informed by established models while maintaining flexibility for the Algerian context. The mixed-methods approach, combining quantitative needs analysis questionnaires, systematic observation checklists, a researcher-led training intervention, and post-training feedback,

provided a robust foundation for understanding both the breadth and depth of the problem. This methodological choice reflected a commitment to participatory, collaborative research that honored teachers as co-creators of knowledge rather than passive research subjects.

Chapter Three presented the data analysis and findings across three research phases: pre-training diagnostic assessment, the training intervention itself, and post-training evaluation. The quantitative data revealed measurable improvements in teachers' digital proficiency, online pedagogical strategies, and classroom engagement techniques. The qualitative findings illuminated the human dimensions teachers' growing confidence, their shifting professional identities, and the emergence of peer support networks demonstrating that professional development is not merely a technical skill acquisition but a transformative personal and professional journey.

Chapter Four synthesized the findings into a forward-looking pathway, offering concrete recommendations for policymakers, institutional leaders, and teachers. It also positioned the research within the broader context of the Union for the Mediterranean (UfM) digital education initiative, extending the local insights to regional significance.

The research was guided by three core hypotheses. The first hypothesis proposed that a comprehensive needs analysis would identify the key skills and competencies ESP teachers require to succeed in online pedagogy. This was validated through the initial diagnostic tools that highlighted major gaps in digital literacy, online engagement strategies, and instructional design among ESP teachers in Algerian universities. The second hypothesis suggested that designing a targeted online training course, supported by an instructional guide, would effectively address these sub-skills and competencies. The development and delivery of the training program confirmed this, as it provided hands-on experience, collaborative learning, and structured reflection aligned with the TPACK framework. The third hypothesis argued that providing ESP teachers with specialized training tailored to their context and level would

enhance their performance and confidence in delivering ESP courses online. This was substantiated through post-training observations and feedback, which showed clear improvements in lesson planning, technology use, and student-centered approaches. Therefore, the three research hypotheses were all affirmed by the study's findings.

The findings from the pre-training phase revealed significant gaps in teachers' technological knowledge, confidence in online instruction, and ability to adapt ESP materials for digital environments. The training phase, conducted collaboratively with an expert in online pedagogy, Mr. Akram Serdani, offered targeted sessions on instructional design, digital tool integration, student engagement strategies, and reflective teaching. Observational data post-training illustrated measurable improvements in teachers' online classroom management, student interaction techniques, and lesson planning. The post-training feedback also reflected high levels of satisfaction among participants, especially concerning the practical applicability of the sessions. Ultimately, the intervention validated the importance of context-specific, co-constructed, and continuous professional development.

The study responded to its research questions in a coherent and evidence-driven manner. It identified key competencies required by ESP teachers for successful online pedagogy, such as LMS navigation, content adaptation, student engagement, and assessment literacy. It demonstrated that targeted professional development strategies, including collaborative training and practical toolkits, effectively addressed these competencies. The intervention proved that specialized training improved teachers' confidence and performance in online ESP instruction. In doing so, the research not only answered its guiding questions but also reinforced the theoretical frameworks underpinning it, especially the applicability of the TPACK model and the social learning principles found in Communities of Practice.

Theoretically, this study enriches the literature on teacher education in digitally constrained environments, particularly within the ESP domain. It situates professional

development within both technological and pedagogical transformation processes, offering a localized interpretation of global frameworks such as TPACK. Practically, it delivers an adaptable training model that Algerian universities and similar contexts may replicate or scale. It also proposes a set of context-sensitive recommendations, including the institutionalization of in-service ESP training programs and the promotion of teacher collaboration through virtual Communities of Practice. Moreover, it provides empirical evidence supporting the integration of action research within teacher development, emphasizing reflective cycles as a vehicle for pedagogical innovation.

The findings of this research underscore several key implications for educational stakeholders. For policymakers, there is an urgent need to design national strategies that incorporate online pedagogy in teacher qualification frameworks and professional development plans. For university administrators, supporting teacher-led initiatives and digital communities can cultivate sustainable professional growth, especially in under-resourced settings. For teacher trainers, emphasis should be placed on hands-on workshops, guided reflections, and peer exchanges to ensure relevance and engagement. For ESP teachers, the study affirms that online pedagogy is not merely a technical skill but a dynamic practice requiring continuous learning, contextual awareness, and collaborative inquiry.

As with any empirical research, this study faced certain limitations. First, the research was conducted with a small purposive sample of eight ESP teachers. Although this limits broad generalizability, the sample size was kept manageable to support the intensive, intervention-based nature of the study. Since the training constituted the researcher's main pedagogical intervention, a smaller group allowed closer follow-up, more individualized support, and better management of the online training environment. Second, the study was carried out within a limited time frame, which made it possible to assess immediate impact but not the long-term sustainability of changes in teaching practice. Third, the findings are context-specific and

reflect the institutional, linguistic, and technological realities of Algerian higher education. For these reasons, the study is understood as a focused and context-sensitive initiative that provides a useful starting point for further research. Future studies may broaden the sample, extend the duration of follow-up, and test the intervention in a wider range of institutional settings.

Building on the foundation of this study, future research could conduct longitudinal studies to assess the sustained impact of digital pedagogy training on teaching practices and student learning outcomes. Comparative studies between different regions or institutions within Algeria may help identify contextual variations in teacher needs. Further research could also investigate the role of AI-driven tools in supporting ESP instruction and teacher development or examine student perspectives more deeply, especially regarding how they experience online ESP instruction from newly trained teachers.

The study affirms that online pedagogy is not merely a technical skill but a dynamic practice requiring continuous learning, contextual awareness, and collaborative inquiry. Teachers are reminded that their role extends beyond content delivery to encompassing digital literacy, pedagogical innovation, and reflective practice. More importantly, the research validates that teachers are capable of growth; with appropriate support, resources, and collaborative spaces, even those who initially felt overwhelmed by technology can develop genuine competence and confidence.

Considering the findings, it becomes evident that professional development for online pedagogy must go beyond technical workshops and address deeper pedagogical, social, and contextual realities. For Algerian ESP teachers, the shift to online education is not just a digital challenge but a call for systemic and sustained educational support. This thesis, grounded in action research and informed by the lived realities of teachers, contributes a meaningful step toward that goal. Ultimately, equipping teachers with the skills, confidence, and mindset to thrive in digital learning spaces is not merely an educational reform strategy it is a necessary

foundation for equitable, inclusive, and future-ready higher education in Algeria and beyond. The findings and recommendations of this study provide a roadmap for institutions, policymakers, and researchers seeking to advance ESP teaching capacity.

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APPENDICES

Appendix 01. Resolution No. 1242 dated September 22, 2022, establishing the Sectoral Committee for Monitoring and Implementing E-learning in Higher Education Institutions

**الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العالي والبحث العلمي**

**قرار رقم 1242 المؤرخ في 22.09.2022... يتضمن إنشاء اللجنة القطاعية
لإرساء التعليم عن بعد في مؤسسات التعليم العالي ومتابعته**

إنّ وزير التعليم العالي والبحث العلمي،

- وبمقتضى المرسوم الرئاسي رقم 22-305 المؤرخ في 11 صفر عام 1444 الموافق 8 سبتمبر سنة 2022 والمتضمن تعيين أعضاء الحكومة،
- وبمقتضى المرسوم التنفيذي رقم 13-77 المؤرخ في 18 ربيع الأول عام 1434 الموافق 30 يناير سنة 2013 الذي يحدد صلاحيات وزير التعليم العالي والبحث العلمي،
- وبمقتضى المرسوم التنفيذي رقم 22-208 المؤرخ في 5 ذي القعدة عام 1443 الموافق 5 جوان سنة 2022 الذي يحدد نظام الدراسات والتكوين للحصول على شهادات التعليم العالي.

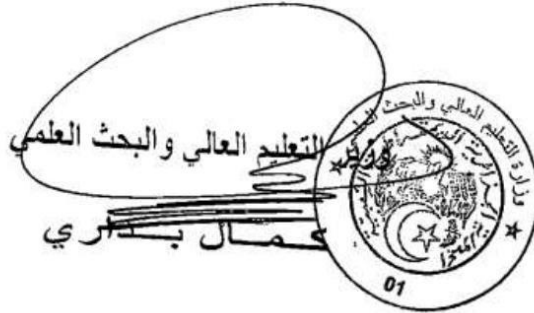
يقرر ما يأتي:

- المادة الأولى :** تنشأ لدى وزير التعليم العالي والبحث العلمي، لجنة قطاعية لإرساء التعليم عن بعد في مؤسسات التعليم العالي ومتابعته ، تدعى في صلب النص " اللجنة " .
- المادة 2 :** تتولى اللجنة متابعة إرساء التعليم عن بعد في مؤسسات التعليم العالي وتقييمه، لاسيما ما يلي:
- القيام بتشخيص ميداني لإمكانات مؤسسات التعليم العالي في مجال التعليم عن بعد، على غرار التجهيزات والأرضيات الرقمية والتأطير البشري،
 - اقتراح عناصر العُدّة التنظيمية اللازمة لضمان وضع حيز التنفيذ التعليم عن بعد،
 - ضمان تناغم الجُهد القطاعي في إرساء التعليم عن بعد بين مؤسسات التعليم العالي، لاسيما من حيث نوعية التجهيزات،
 - تحديد الاحتياجات الحقيقية اللازمة لضمان السير الحسن للتعليم عن بعد، لاسيما من حيث التجهيزات التقنية والأرضيات الرقمية،
 - وضع مخطط متعدد السنوات للتعليم عن بعد، لوضع حيز التنفيذ التعليم عن بعد، وفقا لمبدئي التدرج والأولوية، ضمن إطار التكوين وسنوات التكوين وميادين التكوين المستهدفة.



- اقتراح عناصر مخطط تكوين الأساتذة والتقنيين في مجال تقنيات التعليم عن بُعد ومتابعة تنفيذه،
 - متابعة عملية إنتاج المضامين البيداغوجية الرقمية اللازمة لضمان التعليم عن بُعد،
 - تنظيم تظاهرات علمية ولقاءات موضوعاتية ذات صلة بالتعليم عن بُعد في الوسط الجامعي،
 - رصد التجارب الدولية في مجال التعليم عن بُعد لضمان تكييف المنظومة الوطنية للتعليم العالي في مجال التعليم عن بُعد،
 - المبادرة بكل تدبير آخر يهدف إلى تطوير نمط التعليم عن بُعد في مؤسسات التعليم العالي.
- المادة 3: تعدّ اللجنة نظامها الداخلي وتصادق عليه.
- المادة 4: تتّوج أعمال اللجنة بتقارير دورية ترسل إلى وزير التعليم العالي والبحث العلمي.
- المادة 5: تتولّى المديرية العامة للتعليم والتكوين أمانة اللجنة.
- المادة 6: تحدّد القائمة الإسمية لأعضاء اللجنة في ملحق هذا القرار.
- المادة 7: ينشر هذا القرار في النشرة الرسمية للتعليم العالي والبحث العلمي.

22 سبتمبر 2022
 حُرر بالجزائر، في
 وزير التعليم العالي والبحث العلمي



الملحق

القائمة الاسمية لأعضاء اللجنة القطاعية لإرساء التعليم عن بعد
في مؤسسات التعليم العالي ومتابعته

جامعة قسنطينة 1،	رئيسا	- بلهاني أحمد،
- وسط،	عضوا	- رئيس الندوة الجهوية أو ممثله
- شرق،	عضوا	- رئيس الندوة الجهوية أو ممثله
- غرب،	عضوا	- رئيس الندوة الجهوية أو ممثله
جامعة المسيلة،	عضوا	- زميت عبد الرحيم
المركز الجامعي بتيبازة،	عضوا	- ادريس جوهري
جامعة قسنطينة 1،	عضوا	- طويال إسمهان
المدرسة المتعددة التقنيات للعلوم للهندسة المعمارية والعمارة،	عضوا	- بومنصور رزيقة
جامعة تلمسان،	عضوا	- جزيري فاطمة الزهراء
جامعة وهران 2،	عضوا	- بوروباي صورية
جامعة قسنطينة 2،	عضوا	- أوقامي لونيس
المدرسة الوطنية العليا للاتصالات السلكية واللاسلكية وتكنولوجيات	عضوا	- جلطي محمد
الإعلام والاتصال،		
المدرسة العليا للإعلام الآلي بسيدي بلعباس،	عضوا	- بن صابر جمال عمار
جامعة ورقلة،	عضوا	- قوريشي مراد
جامعة بجاية،	عضوا	- براح سماعين
جامعة قسنطينة 1،	عضوا	- مخانشة جمال الدين
جامعة تلمسان،	عضوا	- قارة تركي هجيرة
المدرسة العليا للأساتذة القبة،	عضوا	- محمد بوضياف
المدرسة العليا للأساتذة بوزريعة.	عضوا	- بن حوحو نبيلة



Appendix 02. Resolution No. 1243 dated September 25, 2022, establishing a national committee to evaluate and improve internet service

الجمهورية الجزائرية الديمقراطية الشعبية وزارة التعليم العالي والبحث العلمي

قرار رقم 1243 مؤرخ في 25 سبتمبر 2022
يتضمن إنشاء لجنة وطنية لتقييم وتحسين خدمة الإنترنت

إن وزير التعليم العالي والبحث العلمي،
- بمقتضى المرسوم الرئاسي رقم 22-305 المؤرخ في 11 صفر عام 1444 الموافق 8 سبتمبر سنة 2022 والمتضمن تعيين أعضاء الحكومة،
- وبمقتضى المرسوم التنفيذي رقم 90-188 المؤرخ في أول ذي الحجة عام 1410 الموافق 23 يونيو سنة 1990 الذي يحدد هيكل الإدارة المركزية وأجهزتها بالوزارات،
- وبمقتضى المرسوم التنفيذي رقم 01-208 المؤرخ في 2 جمادى الأولى عام 1422 الموافق 23 يوليو سنة 2001 الذي يحدد صلاحيات الهيئات الجهوية والندوة الوطنية للجامعات وتشكيلها وسيرها،
- وبمقتضى المرسوم التنفيذي رقم 13-77 المؤرخ في 18 ربيع الأول عام 1434 الموافق 30 يناير سنة 2013 الذي يحدد صلاحيات وزير التعليم العالي والبحث العلمي،

يقرر ما يأتي:

المادة الأولى: يهدف هذا القرار إلى إنشاء لجنة وطنية لتقييم وتحسين خدمة الإنترنت.

المادة 2: تنشأ لدى وزير التعليم العالي والبحث العلمي لجنة وطنية للتقييم وتحسين خدمة الإنترنت، وتدعى في صلب النص "اللجنة"

المادة 3: تعتبر اللجنة هيئة للتنسيق والمراقبة والمتابعة والتقييم وتقديم الاقتراحات، وتكلف على الخصوص بما يأتي:
- وضع السياسة العامة لتحسين أداء خدمة الإنترنت والسهر على ضمان متابعة تنفيذها على مستوى مؤسسات التعليم العالي والبحث العلمي.

- تقييم الخدمات المقدمة لمؤسسات التعليم العالي والبحث العلمي من طرف مركز البحث في الإعلام العلمي والتقني،
- دعم ومراقبة كل مسمى تنظيمي وتقني يتخذ بخصوص تحسين أداء خدمة الإنترنت،
- إقتراح تدابير تحسين تدفق وسرعة الإنترنت التي يستفيد منها الطلبة والأساتذة والباحثين على مستوى مؤسسات التعليم العالي والبحث العلمي.



المادة 4: تتشكل اللجنة من الأعضاء الآتية أسماؤهم:

- تيون فتح الله، مدير جامعة سعيدة، ممثل وزير التعليم العالي والبحث العلمي، رئيسا،
- رئيس الندوة الجهوية للجامعات، لمنطقة الوسط، عضوا،
- رئيس الندوة الجهوية للجامعات، لمنطقة الغرب، عضوا،
- رئيس الندوة الجهوية للجامعات، لمنطقة الشرق، عضوا،
- كوديل مولود، مدير المدرسة الوطنية العليا للإعلام الآلي بالجزائر العاصمة، عضوا،
- بن سليمان سيدي محمد، مدير المدرسة العليا للإعلام الآلي بسيدي بلعباس، عضوا،
- جبراني عبد الحكيم، مدير المالية وزارة التعليم العالي والبحث العلمي، عضوا،
- كزار خالد، نائب مدير للهياكل القاعدية والشبكات، وزارة التعليم العالي والبحث العلمي، عضوا،
- بوقالة شريف، أستاذ، جامعة هواري بومدين للعلوم والتكنولوجيا، عضوا،
- مخلوف سيد أحمد، أستاذ، جامعة وهران 1، عضوا،
- شحيلي حمزة، أستاذ، جامعة قسنطينة 1، عضوا.

المادة 5: تجتمع اللجنة باستدعاء من رئيسها أو من ثلث أعضائها، ويمكنها الاستعانة بكل شخص من شأنه مساعدتها في أشغالها.

تدون نتائج أعمال اللجنة في محاضر، وتسجل في دفتر خاص مرقم ومؤشر عليه من الرئيس. ترسل اللجنة تقريراً حول نشاطاتها كل ثلاثة (03) أشهر إلى السيد وزير التعليم العالي والبحث العلمي.

المادة 6: يكلف الأمين العام بتنفيذ هذا القرار الذي سينشر في النشرة الرسمية للتعليم العالي والبحث العلمي.

حرر بالجزائر في 25 سبتمبر 2022

وزير التعليم العالي والبحث العلمي

كمال بداري



Appendix 03. Resolution No. 1406 dated November 17, 2022, establishing the National Committee for Digitization and defining its tasks, composition, and functioning

الجمهورية الجزائرية الديمقراطية الشعبية وزارة التعليم العالي والبحث العلمي

قرار رقم 1406 المؤرخ في 17 نوفمبر 2022 يتضمن إنشاء اللجنة الوطنية للرقمنة وتحديد مهامها وتشكيلها وسيرها

إن وزير التعليم العالي والبحث العلمي،

- بمقتضى المرسوم الرئاسي رقم 22-305 المؤرخ في 11 صفر عام 1444 الموافق 8 سبتمبر سنة 2022 والمتضمن تعيين أعضاء الحكومة،
- وبمقتضى المرسوم التنفيذي رقم 90-188 المؤرخ في أول ذي الحجة عام 1410 الموافق 23 يونيو سنة 2010 الذي يحدد هياكل الإدارة المركزية وأجهزتها بالوزارات،
- وبمقتضى المرسوم التنفيذي رقم 03-279 المؤرخ في 24 جمادى الثانية عام 1424 الموافق 23 غشت سنة 2003، يحدد مهام الجامعة والقواعد الخاصة بتنظيمها وسيرها، المعدل والمتمم،
- وبمقتضى المرسوم التنفيذي رقم 05-299 المؤرخ في 11 رجب عام 1426 الموافق 16 غشت 2005 الذي يحدد مهام المركز الجامعي والقواعد الخاصة بتنظيمه وسيره،
- وبمقتضى المرسوم التنفيذي رقم 13-77 المؤرخ في 18 ربيع الأول عام 1434 الموافق 30 يناير سنة 2013 الذي يحدد صلاحيات وزير التعليم العالي والبحث العلمي،
- وبمقتضى المرسوم التنفيذي رقم 16-176 المؤرخ في 9 رمضان عام 1437 الموافق 14 يونيو سنة 2016 الذي يحدد القانون الأساسي النموذجي للمدرسة العليا.

يقرر ما يأتي:

المادة الأولى: يهدف هذا القرار إلى إنشاء لجنة وطنية للرقمنة وتحديد مهامها وتشكيلها وسيرها وتدعى في صلب النص "اللجنة".

المادة 2: تكلف اللجنة بمتابعة وتطبيق وإثراء المخطط الوطني للرقمنة الخاص بقطاع التعليم العالي والبحث العلمي بالتنسيق مع اللجان الجهوية.



المادة 3: تشكل اللجنة من الأعضاء الآتية أسماؤهم:

- السيد هراقمي كمال الدين مدير الشبكات وتطوير الرقمنة، ممثلا لوزير التعليم العالي والبحث العلمي، رئيسا،
- السيد بوكزاطة جمال مدير التكوين العالي، عضوا،
- السيد هنين فيصل مكلف بتمسير شؤون الديوان الوطني للخدمات الجامعية، عضوا،
- السيد حرزالله عبد الكريم مكلف بمهمة لدى وزير التعليم العالي والبحث العلمي، عضوا،
- السيد بلخوجة ياسين مدير فرعي لأنظمة الإعلام بمديرية الشبكات وتطوير الرقمنة، عضوا،
- السيدة خوري سلى أستاذة بالمدرسة العليا للإعلام الآلي، عضوا،
- السيد ولد خاوة محمد أستاذ بجامعة البليدة 1، عضوا،
- السيدة قندوز فاطمة مهندسة في الاعلام الاتي بجامعة هواري بومدين للعلوم و التكنولوجيا، عضوا،
- السيد جلول مباركي مهندس في الاعلام الاتي بجامعة المدية، عضوا.

المادة 4: تجتمع اللجنة مرة واحدة كل شهرين (02) في دورة عادية بطلب من رئيسها أو بطلب من ثلث أعضائها.

ترسل اللجنة تقريرا حول نشاطها إلى السيد وزير التعليم العالي والبحث العلمي.

المادة 5: يمكن للجنة أن تستعين بكل شخص من شأنه مساعدتها أثناء تأدية مهامها.

المادة 6: يكلف الأمين العام لوزارة التعليم العالي والبحث العلمي بتنفيذ هذا القرار الذي سينشر في النشرة الرسمية للتعليم العالي والبحث العلمي.

حرر بالجزائر، في 17 نونبر 2022

وزير التعليم العالي والبحث العلمي
كمال بداري



Appendix 04: Resolution No. 1998 of December 22, 2022: Launching a digital platform for teaching English remotely for the benefit of higher education professors

الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العالي والبحث العلمي

الأمين العام

22 ديسمبر 2022

الجزائر في:

الرقم: 1998/ع.ا.ع. 2022

السادة رؤساء الندوات الجهوية للجامعات
بالاتصال مع السيدات والسادة مديري مؤسسات التعليم العالي

الموضوع: بخصوص إطلاق منصة رقمية خاصة بتعليم اللغة الانجليزية عن بعد، لفائدة أساتذة التعليم العالي.

المرجع: ارسالي رقم 1433، المؤرخ في 28 سبتمبر 2022،
ارسالي رقم 1651، المؤرخ في 5 نوفمبر 2022،
ارسالي رقم 1797، المؤرخ في 28 نوفمبر 2022،
ارسالي رقم 1868، المؤرخ في 6 ديسمبر 2022.

عطفًا على المراسلات المذكورة في المرجع أعلاه، والمتعلقة بتعزيز تكوين أساتذة التعليم العالي في اللغة الانجليزية، وتكملة لما تمّ اتخاذه من اجراءات على مستوى المؤسسات الجامعية، مجندين في ذلك كل من مراكز التعليم المكثف للغات (CEIL)، وكذا أقسام اللغة الانجليزية، أعلمكم بأن اللجنة الوطنية للتعليم عند بعد باشرت بإطلاق منصة رقمية خاصة بتعليم اللغة الانجليزية عن بعد، كسند تعليمي بيداغوجي، لفائدة أساتذة التعليم العالي.

وعليه، فإن قطاع التعليم العالي والبحث العلمي قد حدد يوم 2 جانفي 2023 لانطلاق التكوين بهذه المنصة. لذا، أطلب منكم إيلاء عناية خاصة لهذه العملية.

الأمين العام
عبد الحكيم بن تليس



Appendix 05. Resolution No. 1433 dated December 28, 2022, promoting the use of English in higher education

الجمهورية الجزائرية الديمقراطية الشعبية

وزارة التعليم العالي والبحث العلمي

الأمين العام

28 سبتمبر 2022

بالجزائر، في

رقم 1433/ع.1/2022

السادة رؤساء الندوات الجهوية للجامعات،
بالاتصال مع السيدات والسادة مديري مؤسسات التعليم العالي

الموضوع: بخصوص تعزيز استعمال اللغة الإنجليزية في التعليم والتكوين العالين.

في إطار مسعى القطاع الرامي إلى تعزيز تفتح مؤسسات التعليم والتكوين العالين وتحسين مرئيتها على المستوى الدولي، أبلغكم أنه تم ضبط مقاربة تقضي بتعزيز استعمال اللغة الإنجليزية في التعليم والتكوين، والتي لا يمكن تجسيدها فعليًا دون توفر مورد بشري مؤهل. يتعلق الأمر بتكوين الأساتذة الباحثين في اللغة الإنجليزية بمستوى يسمح لهم، لاحقًا، بضمان تدريس مختلف الوحدات التعليمية، تدريجيًا، بهذه اللغة. وفي هذا الشأن، يتعين على كل مؤسسة جامعية، حسب إمكانياتها المتاحة، وكمحلة أولى، تسطير برنامج لتكوين أساتذتها في اللغة الإنجليزية ابتداءً من السنة الجامعية 2022-2023، مع استهداف مستوى تعلم يوافق درجة (B2) أو (C1) على الأقل، على نحو English for specific purposes على مستوى مراكز التعليم المكثف للغات (CEIL)، أو التسجيل في شهادة ليسانس حسب الإمكانيات المتاحة لكل مؤسسة.

تحياتي.

الأمين العام بالنيابة
عبد الحكيم بن ناليس



نسخة مرسلة إلى السيد الوزير (على سبيل عرض الحال).

وزارة التعليم العالي والبحث العلمي - الأمانة العامة

11 طريق دويو مختار، بن عكنون، الجزائر.

الهاتف/الفاكس: 023.23.80.26/44 البريد الإلكتروني: sq@mesrs.dz

Appendix 06. Participant consent form



Consent Form

Title of Project: Improving ESP Teacher Professional Development for Online Pedagogy

Name of Researcher: Salim MENACEUR (mr.salimmenaceur@gmail.com)

Supervisor: Prof. Faiza Haddam Bouabdallah (fhaddam@gmail.com)

I confirm that I have read and understood the Participant Information Sheet for the above study and have had the opportunity to ask questions.

I understand that my participation is voluntary and that I am free to withdraw at any time, up until the data analysis begins, without giving any reason. The data analysis process will start 4 weeks after the finishing all the required project observations. You will thus have 4 weeks to withdraw from this study and any information you've provided up to that point will not be used in my research.

- All names and other material likely to identify individuals will be anonymised.
- Your name will be pseudonymized.
- Personal information will be anonymized within the research dataset. Participants have the option to select a pseudonym, which the researcher will employ when drafting the final report, or they may grant the researcher permission to select a pseudonym for them.
- I understand that confidentiality may be challenging to ensure, particularly in situations involving potential harm or danger to participants or others.
- The material will be treated as confidential and kept in secure storage at all times.
- The material will be destroyed once the project is complete.
- The material will be retained in secure storage for use in future academic research.
- The material may be used in future publications, both print and online.
- I agree to waive my copyright to any data collected as part of this project.
- I understand that other authenticated researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.

- ♦ I understand that other authenticated researchers may use my words in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as requested in this form.

I acknowledge the provision of a Privacy Notice in relation to this research project.

I consent/do not consent to interviews being audibly recorded.

(I acknowledge that copies of transcripts will be returned to participants for verification.)

I agree to take part in this research study ☐

I do not agree to take part in this research study ☐

Name of Participant:

Signature

Date

Name of Researcher: Salim Menaceur

Signature

Date

Appendix 07: Needs Analysis (Pre-Training Phase)

ESP Teacher Digital Proficiency and Needs Questionnaire

Thank you for participating in this quick survey! The purpose of this questionnaire is to understand your level of digital proficiency, your experience with online teaching, and the support you need to improve as an ESP (English for Specific Purposes) teacher. This survey will take around 5-7 minutes to complete.

** Indicates required question*

Section 1: General Information

1. What is your gender? *

Mark only one oval.

- ☐ Male
☐ Female

2. What is your age? *

Mark only one oval.

- ☐ Under 25
☐ 25-29
☐ 30-39
☐ 40-49
☐ 50+

3. What is the highest level of formal education that you have completed? *

Mark only one oval.

- ☐ Bachelor's degree
☐ Master's degree
☐ Doctorate (PhD)

4. Experience in ESP Teaching *

Mark only one oval.

- ☐ 0-2 years
- ☐ 3-5 years
- ☐ 6-10 years
- ☐ More than 10 years

Section 2: Digital Proficiency

5. How would you rate your general proficiency with digital tools (computers, software, etc.)? *

Mark only one oval.

- ☐ Beginner
- ☐ Intermediate
- ☐ Advanced

6. Which digital platforms are you familiar with for online teaching? (Select all that apply) *

Check all that apply.

- ☐ Google Classroom
- ☐ Moodle
- ☐ Microsoft Teams
- ☐ Zoom
- ☐ Google Meet

7. How comfortable are you with using Learning Management Systems (LMS)? *

Mark only one oval.

- ☐ Not comfortable at all
☐ Somewhat comfortable
☐ Comfortable
☐ Very comfortable

Section 3: Experience with Online Teaching

8. Have you taught an online ESP course before? *

Mark only one oval.

- ☐ Yes
☐ No

9. Which ESP course have you taught before?

Mark only one oval.

- ☐ Medical English
☐ Business English
☐ Computer sciences
☐ Technical English
☐ Management English
☐ Other: _____

10. How would you describe your experience with online teaching? *

Mark only one oval.

- ☐ Very challenging
- ☐ Somewhat challenging
- ☐ Neutral
- ☐ Somewhat comfortable
- ☐ Very comfortable

11. Which aspects of online teaching do you find most challenging? (Select all that apply) *

Check all that apply.

- ☐ Using technology effectively
- ☐ Engaging students
- ☐ Assessing student learning
- ☐ Adapting materials for online use
- ☐ Technical issues (e.g., connectivity)

Section 4: Comfort and Training Needs

12. How comfortable are you with creating interactive content for online courses (e.g., quizzes, discussion boards)?

Mark only one oval.

- ☐ Not comfortable at all
- ☐ Somewhat comfortable
- ☐ Comfortable
- ☐ Very comfortable

13. Which skills do you feel you need to develop most to improve your online teaching? (Select all that apply) *

Check all that apply.

- ☐ Using digital tools and platforms effectively
- ☐ Creating engaging online content
- ☐ Assessing student performance online
- ☐ Facilitating online discussions

Section 5: Perceptions and Attitudes

14. How important do you think online teaching skills are for ESP teachers? *

Mark only one oval.

- ☐ Not important at all
- ☐ Somewhat important
- ☐ Important
- ☐ Very important

15. Do you think online pedagogy can be as effective as face-to-face instruction for ESP courses? *

Mark only one oval.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly agree

16. Would you be willing to participate in professional development programs focused on online ESP teaching?

Mark only one oval.

- ☐ Yes
☐ No
☐ Maybe

17. **End of Questionnaire**

★

Thank you very much for your time! Your responses are invaluable in helping us develop tailored support and training programs to enhance online teaching practices for ESP educators in Algeria.

This content is neither created nor endorsed by Google.

Google Forms

Appendix 08: Post-Training Feedback Questionnaire

Post-Training Feedback Questionnaire

Title: Improving ESP Teachers' Professional Development for Online Pedagogy

This feedback questionnaire was administered at the end of the training intervention to collect participants' reflections on the training experience, the relevance of the content, and their self-perceived progress in online ESP pedagogy.

* Indicates required question

Section 1: General Feedback

1. 1. How would you rate the overall quality of the training program? *

Mark only one oval.

- ☐ Excellent
☐ Good
☐ Fair
☐ Poor

2. 2. The training content was relevant to my teaching needs: *

Mark only one oval.

- ☐ Strongly Agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly Disagree

3. **3. The duration of the training were appropriate:** *

Mark only one oval.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

4. **4. The platform used (Zoom) was easy to access and interact with:** *

Mark only one oval.

- ☐ Yes
- ☐ No

Section 2: Training Impact and Outcomes

5. **5. Please rate your confidence in the following areas after completing the training:** (Scale: Very Confident – Confident – Not Sure – Not Confident) *

Mark only one oval per row.

	VC	C	NS	NC
Designing ESP courses for online environments	☐	☐	☐	☐
Using digital tools (Zoom, Google Forms, etc.)	☐	☐	☐	☐
Delivering interactive online lessons	☐	☐	☐	☐
Engaging students in virtual settings	☐	☐	☐	☐
Assessing learners online	☐	☐	☐	☐

6. **6. Which session(s) did you find most useful? Why?** *

Appendix 09: Pre- and Post-training observation checklist / observation grid adapted by the researcher

Pre-/Post-Observation Classroom Checklist

Title: Improving ESP Teachers' Professional Development for Online Pedagogy

This observation checklist was used during the **pre- and post-training classroom observations** to evaluate ESP teachers' performance in online environments. It focuses on five domains: lesson planning, technological integration, pedagogy, communication, and student engagement.

Domain	Indicators	Observed? (✓ / X)	Comments
1. Lesson Planning	➤ Objectives clearly stated and relevant to ESP context ➤ Logical structure and timing of the lesson ➤ Use of authentic or specialized ESP materials		
2. Technological Integration	➤ Effective use of video conferencing tools (Zoom, breakout rooms, polls, etc.) ➤ Use of online platforms or multimedia tools (e.g., Google Docs, Padlet, Kahoot) ➤ Technical proficiency and smooth lesson delivery		
3. Pedagogical Strategies	➤ Use of appropriate ESP teaching techniques (task-based, problem-solving, etc.) ➤ Clear instructions and transitions ➤ Evidence of TPACK-informed practice		
4. Communication	➤ Clear and professional teacher talk ➤ Encouragement of student participation and questions ➤ Use of netiquette and digital communication conventions		
5. Student Engagement	➤ Active involvement of students in tasks and activities ➤ Use of collaborative tools and peer interaction		

Domain	Indicators	Observed? (✓ / ✗)	Comments
	➤ Teacher responsiveness and real-time feedback		

Observer's Name: _____

Teacher Observed: _____

Date: _____

Phase: ☐ Pre-Training ☐ Post-Training

Appendix 10: Pre-Training Observation Example

Pre-/Post-Observation Classroom Checklist

Title: Improving ESP Teachers' Professional Development for Online Pedagogy

This observation checklist was used during the **pre- and post-training classroom observations** to evaluate ESP teachers' performance in online environments. It focuses on five domains: lesson planning, technological integration, pedagogy, communication, and student engagement.

Domain	Indicators	Observed? (✓ / ✗)	Comments
1. Lesson Planning	➤ Objectives clearly stated and relevant to ESP context ➤ Logical structure and timing of the lesson ➤ Use of authentic or specialized ESP materials	✗	Objectives were either too generic or missing altogether. The teacher failed to align the session with students' real-world ESP needs, and there was no evidence of authentic, field-specific materials being used.
2. Technological Integration	➤ Effective use of video conferencing tools (Zoom, breakout rooms, polls, etc.) ➤ Use of online platforms or multimedia tools (e.g., Google Docs, Padlet, Kahoot) ➤ Technical proficiency and smooth lesson delivery	✗	The session relied solely on basic screen sharing via Zoom. No additional digital tools (e.g., collaborative docs, polls) were introduced. The teacher struggled to manage simple technical tasks, causing interruptions.
3. Pedagogical Strategies	➤ Use of appropriate ESP teaching techniques (task-based, problem-solving, etc.) ➤ Clear instructions and transitions ➤ Evidence of TPACK-informed practice	✗	The session was delivered in a traditional lecture format with no integration of ESP-specific teaching strategies. There were no task-based activities or problem-solving elements observed throughout the session.

4. Communication	➤ Clear and professional teacher talk ➤ Encouragement of student participation and questions ➤ Use of netiquette and digital communication conventions	X	Teacher talk dominated the session. Interaction was minimal and limited to cold calls. Student questions were rare, and the teacher did not facilitate a supportive or open communication climate.
5. Student Engagement	➤ Active involvement of students in tasks and activities ➤ Use of collaborative tools and peer interaction ➤ Teacher responsiveness and real-time feedback	X	Students remained passive observers throughout the lesson. No peer-to-peer interaction, breakout discussions, or collaborative activities were attempted. The learning environment lacked dynamism.

Observer's Name: Salim Menaceur

Teacher Observed: P1 – Male, Higher School of Management (Business English, 2 years, Intermediate)

Date: 10-02-2024

Phase: ☒ Pre-Training ☐ Post-Training

Appendix 11: Post-Training Observation Example

Pre-/Post-Observation Classroom Checklist

Title: Improving ESP Teachers' Professional Development for Online Pedagogy

This observation checklist was used during the **pre- and post-training classroom observations** to evaluate ESP teachers' performance in online environments. It focuses on five domains: lesson planning, technological integration, pedagogy, communication, and student engagement.

Domain	Indicators	Observed? (✓ / ✗)	Comments
1. Lesson Planning	➤ Objectives clearly stated and relevant to ESP context ➤ Logical structure and timing of the lesson ➤ Use of authentic or specialized ESP materials	✓	The session was well structured with clear, measurable objectives directly tied to learners' professional domains. Authentic resources like case studies and industry documents were effectively embedded into the session.
2. Technological Integration	➤ Effective use of video conferencing tools (Zoom, breakout rooms, polls, etc.) ➤ Use of online platforms or multimedia tools (e.g., Google Docs, Padlet, Kahoot) ➤ Technical proficiency and smooth lesson delivery	✓	A variety of tools were used seamlessly—breakout rooms for teamwork, Padlet for brainstorming, and Google Docs for live collaboration. The teacher demonstrated confidence in managing tech transitions..
3. Pedagogical Strategies	➤ Use of appropriate ESP teaching techniques (task-based, problem-solving, etc.) ➤ Clear instructions and transitions ➤ Evidence of TPACK-informed practice	✓	The session integrated TPACK-based practices with scaffolded tasks and peer collaboration. Learning activities were relevant to field-specific language functions and required critical thinking.

4. Communication	➤ Clear and professional teacher talk ➤ Encouragement of student participation and questions ➤ Use of netiquette and digital communication conventions	✓	The teacher maintained an encouraging tone, used netiquette appropriately, and facilitated both wholeclass and small-group interactions. Feedback was timely and supportive.
5. Student Engagement	➤ Active involvement of students in tasks and activities ➤ Use of collaborative tools and peer interaction ➤ Teacher responsiveness and real-time feedback	✓	Students were actively engaged through group tasks, interactive polls, and peer assessments. The teacher effectively monitored progress and adjusted pacing to ensure inclusive participation.

Observer's Name: Salim Menaceur

Teacher Observed: P1 – Male, Higher School of Management (Business English, 2 years, Intermediate)

Date: 15-11-2024

Phase: ☐ Pre-Training ☒ Post-Training

Appendix 12: ESP Online Pedagogy Training Booklet



ESP Online Pedagogy Training Booklet

Enhancing ESP Teacher Professional Development for Online Pedagogy



1. Welcome & Introduction

Thank you for accepting to be part of this study. Your participation is invaluable and contributes significantly to advancing knowledge and practice in ESP teaching in online settings.

Welcome to this booklet, designed as a practical and accessible companion for participants in the doctoral research study on improving ESP teacher professional development for online pedagogy. It aims to provide both guidance and resources for educators navigating the shift to virtual ESP instruction.

2. Background & Rationale

This training responds to a critical gap revealed during the COVID-19 pandemic: many ESP educators were unprepared for online teaching. Drawing from research conducted in Algeria, this program addresses challenges such as lack of digital tools, pedagogical training, and content adaptation. The booklet aligns with three core hypotheses:

- Needs analysis identifies key digital and pedagogical competencies.
- A targeted training program addresses these gaps.
- Specialized online training enhances ESP teaching effectiveness.

3. Training Program Overview

- **Title:** Improving ESP Teacher Professional Development for Online Pedagogy
- **Language:** English
- **Mode:** Online (Zoom)
- **Duration:** 12 hours (6 sessions)
- **Participants:** 8 ESP Teachers
- **Trainers:** Salim Menaceur and Akram Serdani

4. Objectives of the Training

By the end of this course, participants will:

- Understand the main differences between face-to-face and online ESP teaching.
- Confidently design and deliver online ESP courses tailored to professional fields.
- Choose the right communication tools for different online teaching situations.
- Build an effective and engaging online presence.
- Apply innovative online pedagogical techniques for task-based and communicative learning.

5. Course Content Overview

Session 1: Introduction to Online ESP Pedagogy – Set the stage by exploring the current online ESP landscape, with a focus on teaching challenges and reflective practice using the TPACK framework. Participants shared teaching experiences to build community.

Session 2: Online Tools and Platforms for ESP – A hands-on session exploring tools such as Zoom, Kahoot, Google Docs, and LMS platforms. Participants practiced both as learners and teachers, emphasizing tech use aligned with pedagogical goals.

Session 3: Interactive Techniques for Online Learning – Focused on engagement strategies like flipped classrooms, breakout room tasks, and gamified learning. Participants designed activities for their contexts, drawing on the Community of Inquiry model.

Session 4: Developing Online ESP Materials – Focused on adapting traditional lessons for online delivery using multimedia and instructional design principles. Teachers created lesson outlines and explored tools like Canva and PowerPoint.

Session 5: Online Assessment and Feedback – Explored methods for evaluating learning and giving feedback online, using tools like Google Forms and video submissions. Teachers practiced giving constructive, digital-friendly feedback.

Session 6: Reflection and Next Steps – A reflective wrap-up using Gibbs' Reflective Cycle. Participants shared key takeaways and action points for future classes, and were briefed on post-training observations and ongoing professional development opportunities.

6. Trainer Profiles

Salim Menaceur

- Co-founder of the online educational platform 'Exit Door'.
- PhD student in English for Specific Purposes (ESP) at Tlemcen University.
- Research Assistant Intern at the Union for the Mediterranean (UfM).
- Graduate of the Erasmus Mundus Master's in Education Policies for Global Development (GLOBED).
- Experienced in online education systems and international development.

Akram Serdani

- Co-founder and Manager of the online educational platform 'Exit Door'.
- Bronze member of the National Association for Special Educational Needs (UK).
- Trained under the British Humanitarian Leadership Academy.
- Experienced trainer in instructional design and online pedagogy.

7. Tools & Platforms

- Zoom (interactive functions)

- Canva (presentation design)
- Google Classroom (course management)
- Padlet, Mentimeter, Kahoot (interaction)

8. Annexes

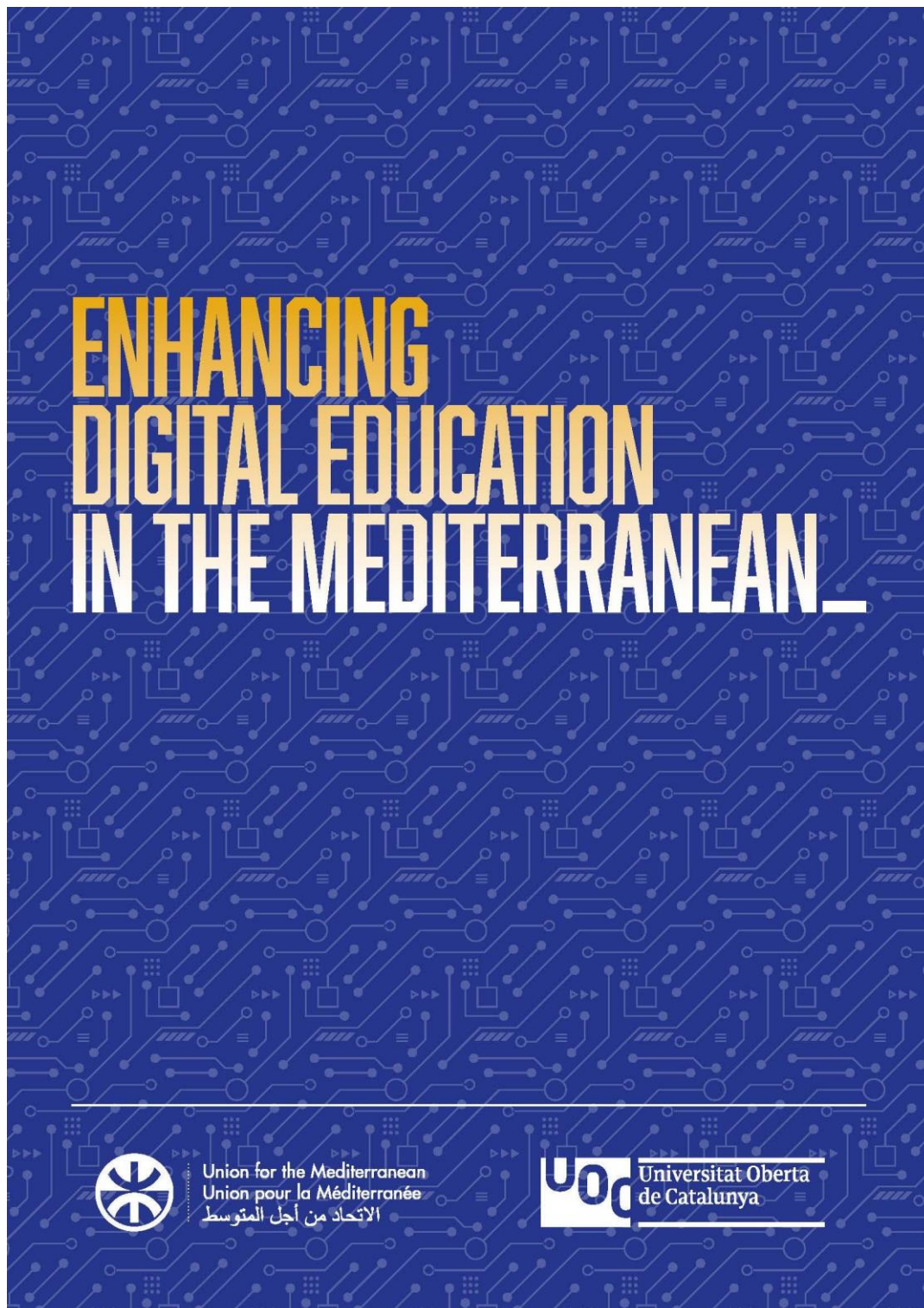
- The consent form of the participants

9. Contact & Acknowledgments

For further information or collaboration inquiries:

- **Email:** salim.menaceur@univ-tlemcen.dz

Appendix 13: UfM Enhancing Digital Education in the Mediterranean Publication



Appendix 14: Certificates of participation in the UfM training





Appendix 15: Algeria's Digital Master Plan (SDN 2022–2025)

24 أكتوبر 2022

رؤية لرقمنة قطاع التعليم العالي والبحث العلمي
المخطط التوجيهي للرقمنة (SDN)

الجزء 1:

مؤسسات التعليم العالي

النسخة النهائية

وزارة التعليم العالي والبحث العلمي
11، طريق مختار دودو - بن عكنون - الجزائر

Summary

This doctoral research investigates how the professional development of English for Specific Purposes (ESP) teachers can be improved for online pedagogy in Algerian higher education. The study is grounded in the recognition that the shift to online teaching, especially after the COVID-19 pandemic, exposed important gaps in ESP teachers' preparedness to teach effectively in digital environments. Adopting a mixed-methods action research design, the study was conducted with eight ESP teachers and unfolded through three main phases: a needs analysis phase, a training phase, and a post-training evaluation phase. Four research instruments were used: a needs analysis questionnaire, observation grids, the online training intervention, and a post-training feedback questionnaire.

The findings reveal that the intervention contributed to improving teachers' digital competence, lesson organization, online interaction practices, and student engagement strategies. The study also shows that effective professional development for online ESP teaching requires more than technical training; it must integrate pedagogical support, reflective practice, and sustained collaboration among teachers. On this basis, the thesis advocates the integration of the TPACK model, the promotion of communities of practice, and the establishment of continuous institutional support systems. The study contributes both to ongoing educational reform in Algeria and to the broader discussion of ESP teacher development in digitally mediated contexts.

Keywords: ESP, online pedagogy, professional development, action research, Algerian higher education.

Résumé

Cette recherche doctorale examine comment améliorer le développement professionnel des enseignants d'anglais de spécialité (ESP) pour la pédagogie en ligne dans l'enseignement supérieur algérien. Elle part du constat que le passage à l'enseignement en ligne, notamment après la pandémie de la COVID-19, a mis en évidence d'importantes insuffisances dans la préparation des enseignants d'ESP à assurer un enseignement efficace dans des environnements numériques. Adoptant une démarche de recherche-action à méthodologie mixte, l'étude a été menée auprès de huit enseignants d'ESP et s'est déroulée en trois phases principales : une phase d'analyse des besoins, une phase de formation et une phase d'évaluation post-formation. Quatre instruments de recherche ont été mobilisés : un questionnaire d'analyse des besoins, des grilles d'observation, l'intervention formative en ligne et un questionnaire de rétroaction post-formation.

Les résultats montrent que l'intervention a contribué à améliorer les compétences numériques des enseignants, l'organisation de leurs cours, leurs pratiques d'interaction en ligne ainsi que leurs stratégies d'engagement des étudiants. L'étude met également en évidence que le développement professionnel des enseignants d'ESP pour l'enseignement en ligne ne peut se limiter à une simple formation technique ; il exige aussi un accompagnement pédagogique, une pratique réflexive et une collaboration durable entre enseignants. À cet égard, la thèse recommande l'intégration du modèle TPACK, la promotion des communautés de pratique et la mise en place de dispositifs institutionnels de soutien continu. Elle contribue ainsi à la dynamique de réforme éducative en Algérie ainsi qu'au débat plus large sur le développement professionnel des enseignants d'ESP dans les contextes numériques.

Mots-clés : ESP, pédagogie en ligne, développement professionnel, recherche-action, enseignement supérieur algérien.

الخلاصة

تتناول هذه الأطروحة سبل تحسين التطوير المهني لأساتذة الإنجليزية لأغراض خاصة من أجل التدريس عبر الإنترنت في التعليم العالي الجزائري. وتنطلق الدراسة من أن الانتقال إلى التعليم الرقمي، خاصة بعد جائحة كوفيد-19، كشف عن نقائص مهمة في جاهزية أساتذة الإنجليزية لأغراض خاصة للتدريس بفعالية داخل البيئات الرقمية. واعتمدت الدراسة على منهجية بحث إرائي ذات مقارنة مختلطة، وشملت ثمانية أساتذة، ومرت عبر ثلاث مراحل رئيسية: مرحلة تحليل الاحتياجات، تصميم وتنفيذ برنامج تدريبي رقمي، ومرحلة التقييم بعد التدريب. كما استخدمت أربع أدوات بحثية هي: استبيان تحليل الاحتياجات، وشبكات الملاحظة، والتدخل برنامج تدريبي رقمي، واستبيان بعد برنامج تدريبي رقمي.

وأظهرت النتائج أن هذا التدخل ساهم في تحسين الكفاءة الرقمية للأساتذة، وتنظيم الدروس، وممارسات التفاعل عبر الإنترنت، واستراتيجيات إشراك الطلبة. كما بينت الدراسة أن التطوير المهني الفعال لأساتذة الإنجليزية لأغراض خاصة في مجال التدريس الرقمي لا يقتصر على التكوين التقني فقط، بل يتطلب أيضًا دعمًا بيداغوجيًا، وممارسة تأملية، وتعاونًا مستمرًا بين الأساتذة. وانطلاقًا من ذلك، توصي الأطروحة باعتماد نموذج TPACK، وتعزيز مجتمعات الممارسة، وإرساء آليات دعم مؤسسية مستمرة. وبذلك، تسهم الدراسة في جهود إصلاح التعليم في الجزائر، كما تقدم إضافة علمية وعملية للنقاش المتعلق بالتطوير المهني لأساتذة الإنجليزية لأغراض خاصة في السياقات التعليمية الرقمية.

الكلمات المفتاحية: الإنجليزية لأغراض خاصة، البيداغوجيا الإلكترونية، التطوير المهني، البحث الإرائي، التعليم العالي الجزائري.