

معرفة المحتوى التربوي: تحدي تدريس مصطلحات ESP
Pedagogical Content knowledge: the challenge of teaching ESP
terminology

Lehalali Hanane, Brakni Dalila

Department of English, faculty of foreign languages, Lounici University Blida 2,
lehlali.hanane@gmail.com

Department of English, faculty of foreign languages, Lounici University Blida 2,
dalila.brakni@gmail.com

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Abstract		المخلص
<p>The growing demand for English as a professional language in various domains is today beyond doubt. In order to meet university students' needs of using English, the Algerian universities included English for Specific Purposes (ESP) in the curricular in which terminology is crucial. Yet, in terms of challenges, the ESP teachers has often been viewed as inadequately prepared for the job, since they lacked pedagogical content knowledge (PCK) related to the complex nature of (ESP) courses and specialized terminology. This paper aims to provide an overview of the discussion on language knowledge base required for teaching English for Specific Purposes (ESP), with particular focus on pedagogical content knowledge as a unique component. Finally, the paper suggests some practical pedagogical measures that may help ESP teachers overcome the challenge of teaching specialized terminology in ESP contexts.</p>		<p>إن الطلب المتزايد على اللغة الإنجليزية كلغة مهنية في مختلف المجالات لا شك فيه اليوم. استجابة لهذا الاتجاه، قدمت الجامعة الجزائرية دورات اللغة الإنجليزية لأغراض محددة (ESP) في معظم، إن لم يكن جميع الأقسام العلمية التي تعتبر المصطلحات فيها حاسمة. ومع ذلك، من حيث التحديات، غالبًا ما يُنظر إلى معلمي ESP على أنهم غير مستعدين بشكل كافٍ للوظيفة، لأنهم يفتقرون إلى معرفة المحتوى التربوي (PCK) المتعلقة بالطبيعة المعقدة للدورات (ESP) والمصطلحات المتخصصة. تهدف هذه الورقة إلى تقديم لمحة عامة عن المناقشة حول قاعدة المعرفة اللغوية المطلوبة لتدريس اللغة الإنجليزية لأغراض محددة (ESP)، مع تسليط الضوء على بناء معرفة المحتوى التربوي كعنصر فريد. أخيرًا، تقترح الورقة بعض التدابير التربوية العملية التي قد تساعد معلمي ESP على التغلب على التحدي المتمثل</p>

	<p>في تدريس مصطلحات المتخصصة في سياقات ESP.</p>
<p>Key words: Pedagogical Content Knowledge (PCK), English for specific purposes (ESP), ESP terminology, ESP challenges, pedagogical practices.</p>	<p>الكلمات المفتاحية: معرفة المحتوى التربوي (PCK)، اللغة الإنجليزية لأغراض محددة (ESP)، مصطلحات ESP، تحديات ESP، الممارسات التربوية.</p>

Lehalali Hanane, lehlali.hanane@gmail.com

1-INTRODUCTION

Teaching English for Specific Purposes (ESP) in scientific faculties requires more than a sound knowledge of subject matter, being able to explain content that is characterized by highly specialised terminology using effective teaching strategies are also key components of teacher's professional knowledge. The issue of ESP terminology represent a challenge for ESP teachers who are encountered with complex and sometimes strange terms. This task requires teachers to widen their scope in terms of knowing the nature of these terms and the useful strategies of instruction. In his narrative study of English teacher's knowledge, Elbaz (1983) stated that "the single factor that seems to have the greatest power to carry forward our understanding of teacher's role is the phenomenon of teacher's knowledge" (p.11), This in turns led to questioning the knowledge base of language teacher. Research about teacher's knowledge has revealed the importance of developing three types of teacher knowledge; Content Knowledge CK, Pedagogical Knowledge PK and Pedagogical Content Knowledge PCK. Although these components are critical in the knowledge base of teachers, the Study of PCK is relatively new in some disciplines. PCK was introduced by Shulman (1986) as part of his attempt to professionalize the occupation of teaching. He described the construct of PCK as the missing paradigm in research on teaching and teacher knowledge and believed to be a significant type of knowledge that contributes to effective teaching practices as it relates to the ability to represent content in a particular field of study

Although the PCK for teaching has been investigated in various disciplines such as mathematics, science and language teaching (Cochran; Smith& Lytle, 1999; Grossman, 1990; Smith, 2001, Wilson & Wineburg, 1988), teacher's PCK in ESP teaching is still an understudied area. This paper attempts to fill in the

gap by conceptualizing the nature of PCK of ESP teachers who commonly teach English courses in highly specialized contexts. These courses are generally intended to prepare student for proper use of the target language in their specialised field of interest. As shown in several recent studies (Bouguebs, 2018), ESP teachers in Algerian higher education do not have disciplinary training. Thus, understanding PCK in the context of ESP deemed necessary since this category of instructors are expected to perform their profession in contexts beyond their area of expertise. In Saad Dahleb University of Blida 2, teaching English falls under the realm of English for science and technology (EST) which is characterized by highly specialized English terminology and hence, requires specialized pedagogical practices. Central to ESP learning is the specialized terminology, also known as technical English, with certain of its features encountered at the lexical levels and discourse levels. Research that covered specialized knowledge required for teaching terminology is limited, thus ESP teachers struggle for a complete understanding of teaching material. Accordingly, this type of knowledge needs to be integrated in the professional knowledge for teaching. Adequate PCK can help ESP teachers decide upon the pedagogical strategies to teach ESP content which is characterised by specialized terminology in ways that promote effective learning. Consequently, discerning ESP teachers PCK may help begin the building of PCK foundation for informing teacher education programs and foster ESP development.

2-PROFESSIONAL KNOWLEDGE BASE FOR TEACHING

Teachers differ substantially in their ability to promote students learning and create meaning within learning environment (Nye et al, 2004), For this, teachers need to possess deep professional knowledge which can be described as the “complex network of knowledge” (Borg, 2003) that informs practice in classroom context. Accordingly, extensive research has been conducted in order to identify the networks of knowledge required for effective teaching and examine the attributes that characterised competent teachers. Relevant to this discussion is to start with general understandings on knowledge base for teaching before highlighting how these networks might be conceptualized in ESP teaching.

2.1-Knowledge base required for teaching

Teacher knowledge was inspired by Schon’s (1983) influential work on reflective knowledge. He argued that what teachers do in classroom is not “knowing” and “acting” as two separate processes, but an integrated process of “knowing in action”. His views raised interest in understanding the specialized knowledge held by teachers across various disciplines. Language education research started to show tendency toward understanding what and how teachers know what they know and how they use such knowledge in their classrooms.

For example Elbaz and Clandinin (1985) argued for the personal and practical knowledge held by teachers. Johnson (2009) described knowledge base of language teacher as “a widely accepted conception of what people need to know and are able to carry out their work of a particular profession.” In the context of ESP, teacher’s knowledge about language is not very different from the knowledge hold by English for general purposes (EGP) teachers. The knowledge they possess constitutes a clear conceptualization of the structure of language system, general theories and methods of teaching and learning. In practice, it is fundamental for teachers to be equipped with this knowledge to practice their teaching activities yet, it may not be sufficient in the context of ESP teaching, given that this category of instructors need to perform multiple tasks simultaneously and make certain pedagogical choices in their highly specialized classrooms. This view of teacher learning reveals that unlike EGP teaching, ESP teaching is more complex task only mastered by strong knowledge base which account for unique and specialized knowledge that relates to the content and target related nature of ESP contexts independent of subject matter knowledge.

While various models exist, the most influential model describing teacher knowledge base was developed by Shulman in the late 80s and further developed by other researchers. Shulman (1986) draws attention to the fact that the knowledge of subject matter required for teaching seem to be incomplete. He argued for three basic domains of teacher professional knowledge: content knowledge (KC), pedagogical knowledge (PK) and pedagogical content knowledge (PCK), Baumert (2010) consider these knowledge domains as key cognitive components of teacher’s competence. Among these key component, PCK -that is knowledge required to make subject matter accessible to learners- has been widely researched. (Depaepe et al 2013), Baumert (2010) adds that recent studies view PCK as a significant element of teacher knowledge, which has a direct impact on the quality of teaching and learning. Afterwards, Shulman broadened the knowledge domains to include knowledge of learners, context and the curriculum. Shulman’s views contributed to the field of teacher knowledge and were followed by several studies across various disciplines Such as Grossman’s (1990) research.

Research and studies of the nature of second language teacher adopted qualitative research tools mainly interviews focusing on teacher’s thought processes, classroom decisions making and their impact on classroom practice. The results obtained from these studies are similar to those in general teacher education literature, mainly, that teacher’s pedagogical practices are shaped by teacher’s personal views and beliefs and oriented to the context in which they work. Teacher’s personal beliefs and ideas, As Elbaz (1983) pointed out, encompasses their experience of student’s learning style, interests, needs,

strengths and difficulties, and a repertoire of pedagogical strategies. Teacher's ideas often take the form of principles, established through experience, that highlight their own beliefs about language and language teaching, teacher's role and teacher learner relationship (Johnson, 1992; Richards, 1996)

These findings revealed the significance of sociocultural perspectives on human learning which changes understanding on how teachers learn to teach, think about language and teach a second language. Teachers need to share sociocultural awareness that is to say the broader, social, cultural and historical macro—structures that are subject to change in the second language teaching profession. This becomes even more important as ESP teachers are expected to perform their job in highly contextualized classrooms. This awareness helps teachers choose appropriate strategies that promote language and terminology learning and cater for their needs. It is with increased awareness to these contexts that sociocultural perspectives brought that teachers can achieve understanding and create the kind of classroom communities that allow for proper communication between students in their target professions.

A well sophisticated professional knowledge base for teaching encompasses all teachers' cognitions required for effective teaching. In order to characterise this knowledge, Shulman and his colleagues developed several domains of knowledge that seem to be relevant to the job of teachers: General pedagogical knowledge, with special reference to those broad principles and strategies of classroom management and organisation that appear to transcend subject matter, Knowledge of learners and their characteristics, Knowledge of educational contexts, Knowledge of educational ends, purposes and values, Content knowledge, Curriculum knowledge and Pedagogical content knowledge. These categories focused on the importance of content knowledge in the large domains of professional knowledge for teaching. The first four components refer to general pedagogical understandings and skills which are not emphasized in this classification. The last three categories refer to all content-specific dimensions. The fact that the first four domains are not central in his model, does not deny their significance to teacher knowledge. Shulman argues that "mere content knowledge is likely to be as useless pedagogically as component-free skill" (p.8),

The first, content knowledge includes the subject matter and its substantive and syntactic structures (Grossman, 1990, Wilson 1991) as well as beliefs about content. The substantive knowledge refers to the facts and concepts of a discipline and its organizing frameworks. The syntactic knowledge refers to the means by which the propositional has been generated and established. Beliefs refer to the aspects related to subject matter. According to recent research in second language education, subject matter knowledge has been referred to as"

teacher language awareness” (TLA) (Andrews, 2007), It includes teacher’s knowledge of language systems (including phonological, lexical, grammatical and discourse features of second language), and their meta-linguistic knowledge. This knowledge was found to be significant for effective teaching. Anderson (2007) further concluded that subject matter knowledge was intertwined with teacher’s beliefs about grammar and terminology teaching, for example, how it should or can be taught and learnt in a particular context. Borg’s (2006) empirical studies on teacher’s knowledge and beliefs about grammar and grammatical terminology show that teacher’s decisions were not borne out in their classroom settings. This latter, indicated that teacher’s pedagogical choices were shaped by their personal beliefs and values. These findings call for more pedagogically- oriented understanding on language teaching.

Central to teacher’s knowledge is the concepts of general pedagogical knowledge which refers to principles and strategies of classroom management and frameworks that are cross-curricular, and pedagogical content knowledge PCK which refers to the knowledge which combines the content knowledge of specific topic and the pedagogical knowledge for teaching that particular topic. The last and the most influential element of teacher’s knowledge is the concept of PCK that represents “the missing paradigm” in research on teaching. This latter is believed to have a direct impact on the quality of teaching and thus, was followed by extensive research.

Shulman’s ideas, views and studies draw attention to more research interested in understanding the knowledge base needed for professional teaching in either general education or in the English as a Foreign Language (EFL) context. In order to guarantee the quality of teaching in higher education, pedagogical content knowledge needs to be fully mastered by teachers (Norasliza and Zaleha, 2008),

An adaptation of the Shulman’s original classification was introduced by Turner-Bisset (1990), She provided a more extended set of knowledge bases for teaching along with the specific areas that each domain included. These are: subject matter knowledge, curriculum knowledge, general pedagogical knowledge, knowledge of models teaching, knowledge of learners, knowledge of self, knowledge of educational contexts, knowledge of educational ends, and pedagogical content knowledge.

This classification included two more components which are not part of the list provided by Shulman. The first, knowledge of models of teaching refers to teachers’ beliefs and perceptions about teaching. This view reveals that teaching requires not only knowledge, but also incorporates some personal views, beliefs and values The second, knowledge of self, was found to be a significant domain because of the importance of self-image and self-reflection in

teachers' professional development. This view is further agreed by other researchers such as (Elbaz., 1981; Clandinin, 1989, Rihards, 1996) who believe that this type of knowledge relates to teacher's personal philosophy of what good teaching constitutes.

Another attempt to conceptualize the area of teacher professional knowledge was provided by Cochran Smith & Lytle (1999) in which they distinguished several components of the knowledge base required for teachers of English as Second Language (ESL), This knowledge includes mainly general theories and a wide range of formal knowledge about teaching. They suggested eight areas as components of the knowledge base for teaching. Their categories included: content or subject matter knowledge, knowledge about disciplinary foundations of education, human development and learners, classroom organizations, pedagogy, assessment and the social and cultural contexts of teaching and schooling, and the knowledge of teaching as a profession.

This classification however, draws some distinction between the underlying elements of teaching and teaching practice since it is based on the structural division introduced by the educational institutions. Hegatry (2000) further adds that these elements are separated from each other, but provide no attempt to combine these different understandings within a common framework. Similarly, Tsui's (2003) classification of teacher knowledge results in a hierarchical separation between the underlying elements of teacher knowledge which goes against the common assumption that teacher's different areas of knowledge are interrelated in practice.

The conclusion drawn from these studies and classifications revealed that teaching a subject require more focus on the how teachers understand what they know rather than on how much they know. As stated by Shulman (1991), teaching a subject necessitates more understanding about the content to be taught and how the nature of that knowledge may differ from one content area to another to be able to make that content comprehensible to students. In addition, most studies on teacher knowledge draw distinction between principled knowledge (knowing what) and procedural knowledge (knowing how) from cognitive psychology which is more relevant way of understanding teacher knowledge. It focuses on how knowledge informs teacher's behaviour manifested in teaching practices. Furthermore, the set of classifications provided above reveals the complexity of identifying the content of teacher knowledge base. Recent studies (Jones and Straker, 2006) suggest the need to account for the inter-relationship between various knowledge domains proposed by researchers. These domains need to be treated as an integrative body of knowledge base for teaching.

In the context of ESP teaching, it appears that teaching a subject requires more than deep understanding of basic concepts and the collection of facts of the various and specific disciplines that ESP serve. Despite the usefulness of this knowledge, teachers also need to know how these concepts are structured and linked with different ways of representations which will enable teachers to translate their subject matter knowledge in actual teaching contexts. It makes teacher's task highly demanding and increasingly challenging since they are as viewed as, Dudley Evans (1998) referred to, "strangers in an uncharted land". These findings endorse Shulman's views that pedagogical content knowledge lies at the heart of teacher knowledge.

2.2-Knowledge base for ESP teaching

Shulman is one of the first researchers to highlight the idea of teacher cognition and its impact on the process of teaching. His concept of PCK covers all the professional knowledge bases and personal beliefs, views and assumptions possessed by teachers about their profession. Following Shulman's observations, researchers agreed on the notion of teacher language awareness (TLA) and knowledge about language (KAL) as the knowledge of language hold by teachers for instructional uses (Thornbury, 1997), It includes linguistic and metalinguistic awareness which is central to expert language teachers (Hales, 1997), Based on understanding of language as a system, knowledge about language is relevant to ESP teaching since it is concerned with language use, communication proficiency, and socio-semantic meaning. However, the concept of KAL does not fully account for the subject matter knowledge of ESP who are expected to cope with contexts involving highly specialized content, in addition to language instruction and pedagogical knowledge. In this respect, ESP teacher's PCK must include an additional knowledge base with elements related to the discipline the ESP entails.

When applied to ESP, the distinction between pedagogical knowledge and subject matter knowledge is not clear due to the complicated difference between ESP teacher knowledge and that of the subject specialist. There is an unresolved debate over who should explain subject related concepts and terminology. Due to the scarcity of research in the area of ESP teacher knowledge, it remains unclear about what subject matter knowledge an ESP teacher is required to possess for professional effective teaching in various ESP contexts. Hutchinson and Walters (1987) stated that ESP teachers "have to struggle to master language and subject matter beyond the bounds of their previous experience" p.106 but it is difficult to identify the components of ESP teacher's knowledge. In one of the few attempts to identify the areas of teacher knowledge base, Ferguson (1997) distinguishes three domains: knowledge of disciplinary cultures and values: a form of knowledge which is essentially sociological or anthropological;

knowledge of the epistemological basis of different disciplines: a form of knowledge which is philosophical in nature; and knowledge of genre and discourse, which is mainly linguistic in character.

Belcher (2006) argues that content knowledge is one of the components that ESP practitioners need to possess in order to tackle, effectively, the different content areas relevant to ESP students. Lack of appropriate content knowledge constitutes a hurdle that prevents teachers from successfully performing their job in various ESP areas (Estage, and Nazari, 2015), This fact highlights the need for discipline-specific knowledge as a significant component of ESP teacher's knowledge base. This knowledge is needed to help teachers overcome the difficulty of dealing with ESP words since they are low frequency words and represent a hurdle in mediating content.

3. PEDAGOGICAL CONTENT KNOWLEDGE

The claim for pedagogical content knowledge was founded in Shulman's observations that effective teachers in the Knowledge Growth in Teaching Study Project" employ metaphors, analogies and various forms of illustrations that were appropriate to student's learning as well as the subject matter being taught (Grossman, 1999), According to Shulman (1986), PCK is a unique domain of teacher knowledge "which goes beyond knowledge of subject matter per se to the dimension of subject matter knowledge for teaching" (p.9), It was defined as a "special amalgam... or blending of content and pedagogy into an understanding on how particular topics, problems or issues are organised, represented and adopted to the diverse interests and abilities of learners and presented for instruction." (Shulman, 1987 p.9), Nevertheless, this definition revealed that PCK is more of a combination between content knowledge and pedagogical knowledge rather than being a distinct domain and knowledge. PCK also includes teacher's ability to anticipate learning difficulties and student's misconceptions combined with the ability to help them understand subject matter knowledge employing the "most useful forms of those representations, and the most powerful analogies, illustrations, examples, explanations and demonstrations in a word, the ways of representing and formulating the subject that makes it comprehensible for others". This definition reveal four components of PCK: representations, which refers to the range of analogies, illustrations, examples, explanations and demonstrations used to present key ideas and concepts to students, what makes the learning of specific topic easy or difficult, learner prior knowledge: preconceptions and misconceptions that students bring with them and knowledge of appropriate teaching strategies. The ability to understand a subject is different from the ability to represent it to learners. It requires a distinct type of knowing a subject in form of appropriate teachable units to be taught

Grossman (1999) further divides PCK into four components: conceptions of purposes for teaching a subject matter, knowledge of student's understanding, curriculum knowledge, and knowledge of instructional strategies. Shulman argues that PCK is subject to development, an important aspect that helps teachers gain expertise. Relatively, Shulman highlights "pedagogical reasoning", a process by which teachers use subject matter knowledge to produce PCK (Shulman, 1987; Wilson et al, 1987)

Although conceptualisation of PCK differ, literature on the issue revealed that two components are mostly included, knowledge of students understanding and learning, and knowledge of teaching in concrete content domain (Depaepe et al, 2013), These components refer to subject matter in concrete situations, a fact that places PCK apart from general PK and learners, learning and teaching. Recent studies shows that PCK included a distinct and unique features compared to CK concerning teacher's ability to predict appropriate class activities and students understanding (Baumert et al, 2010), These studies resulted in two ain conceptualization of PCK. The first, descried PCK as a redundant concept contained within subject matter knowledge (McEwan and Bull, 1991), The second is based on the integrative model of PCK (Gress-Newsome 1999), content knowledge, pedagogical knowledge and context knowledge are considered as distinctive areas of teacher knowledge, and PCK can be generated from these resources in actual teaching situations.

PCK of English language teachers becomes one of the specific issues to be discussed. In this respect, Liu (2013) discussed PCK of English teachers in the US context. Based on Shulman's model, Liu conceptualizes PCK as the integration of subject and pedagogy. The research focused on the process by which teachers translate subject matter into well organised, interesting unites that meets student's needs. Liu concluded that ESL teachers with CK would be able to teach whereas, those with PK would be more efficient in providing a variety of teaching strategies. PCK, as an integration of both content and pedagogy can be developed through practice in actual teaching environments. In the same line of interest, Irvine-Nniakari and Keily (2015) investigated PCK of ESL teachers in teaching reading skills. The research concluded that that teachers need to possess not only knowledge about text and its context, but also knowledge about reading instructional strategies to help student properly understand the text as a whole. The research also highlighted the role of teacher's mental cognition in effective teaching. This includes teacher's way of thinking, knowing, and personal beliefs about the complex nature of teaching and learning. At this stage, PCK components encompass teachers understanding of subject, learners, curriculum, context and pedagogy. Subject matter and pedagogy are central elements of teacher's knowledge in real teaching contexts.

Shulman's introduction to the concept of PCK was influential in the field of teacher research. It paved the way for further research on teacher knowledge in the context of ESP. It also highlighted the significance of teacher's understanding of the domain and its relationship to teaching.

3.1 PCK in ESP teaching

ESP teachers are expected to perform their job in teaching contexts involving the realm of content studies, in addition to terminology and pedagogy. Therefore their PCK should include additional knowledge base with cognitions linked to the core concepts, values and practices of specific fields of study. Yet, few researches in teacher cognition has attempted to identify the professional knowledge of ESP practitioner, particularly due to the assumption that ESP teaching is not truly different from English for general purposes EGP except for the need to tailor input according to learner's various specializations.

Accordingly, PCK for ESP teaching needs to be thoroughly researched in order to improve teaching practice. According to Shulman's (1986), PCK goes beyond content knowledge to include the application of that knowledge to specific teaching contexts. This view reveals that PCK is more practical and therefore, it help's teachers better represent their content of subject matter using appropriate strategies of teaching technical English in various ESP settings to their students.

Based on the views of Shulman, Borg, Anderson and others, the overall PCK for ESP teaching should be identified as comprising of three knowledge bases: the language knowledge base, comprising cognitions about language in general, the target language, and the specialist discourse taught; the subject content knowledge base, containing at least basic-level cognitions about the academic discipline, profession or occupation to which the ESP taught is related; and the pedagogical knowledge base, made up of cognitions about general and specific language pedagogy, including theories of learning.

It is further stated that PCK in ESP teaching is complex to identify due to the cross-disciplinary nature of ESP (Dudley Evans & St Johns, 1989), A more specific classification of PCK is provided by Wu (2013) for Business English teaching. It includes: knowledge of the purpose for teaching the subject matter, knowledge of students understanding of Business English, knowledge of instructional strategies and representations. These broad categories are further divided into sub-components of representation and classroom activities to illustrate the set of knowledge required by teachers for Business English terminology which is one among the various specialised fields in the world of ESP.

These components indicate that there is no clear distinction between teachers cognitions, as some of them seem to belong to more than one category.

In this sense, it can be stated that while the construct of PCK of ESP teachers includes separate knowledge bases is helpful as a framework for describing what an effective practitioner is required to possess to be able to display teaching activities that facilitates terminology learning.

4. THE CHALLENGE OF TEACHING ESP TERMINOLOGY

The dominance of English as a language of science, technology and scientific publications gives raise to ESP. This approach has been developed to meet the demand for learning this language by learners all over the world. ESP addresses a set of professional and academic needs of students in the various disciplines that ESP serves. These needs centres around technical terminology as well as language skills that ESP learners need to use English in professional context and for professional purposes (Hutchinson and Walters, 1987), ESP terminology can be referred to in the literature by different names. These terms include special purpose, specialized and technical terminology. In essence, these terms usually refer to specialized words of a particular subject area at university or to a professional discipline. ESP learners involved in one of those ESP areas are expected to understand and use this language fluently. To succeed in meeting the learner's needs, ESP teachers are expected to broaden their knowledge about the ESP teaching/learning world. The same issue represent a challenge for ESP teachers in the university context. Of all the obstacles encountered by ESP practitioners, the challenge of teaching technical vocabulary seems to be on top of the list. This is especially difficult in scientific faculties where teaching English falls under the realm of English for Science and Technology (EST), The branch of (EST) embodies the principles of teaching English in scientific and technical fields. Baghli (2014) defines EST as "another ESP genre that is widely used and needed in almost all scientific, technical and technological faculties" p (73), Since ESP teachers lack necessary discipline-specific knowledge, they struggle with the task of teaching highly technical terminology. Teachers are encountered with strange and complex terms derived from Greek and Latin origin (Abdullah, 2015), In the medical context, for example, both teachers and learners struggle with the complex nature of medical terminology because of the diversity of its sources such as amonasehydrochardeoymphaeoid, encephalomyeoneuropathy, desmatomucosomyositis. It also includes strange, unexpected words such as those with triple (o) in hysterosingoophorectomy (Abdullah, 2013), Due to the complexity of these terms being mostly compound, long multi-morphemic, teachers found it hard represent and teach in the classroom. To phrase it differently, lack of expertise as well as specialized PCK concerning technical vocabulary can negatively affect ESP teachers' confidence and hence results in a debilitating fear of teaching specialized fields. Therefore, teaching ESP requires teachers to widen their scope of knowledge about the

different practical pedagogies to represent technical vocabularies. The challenge encountered by ESP teachers in an ESP land make it essential to upload them with new pedagogies via professional teacher training programs. However, this area of interest has not received all researchers' attention (Kennedy, 1983). Thus, this paper suggests some measures to be considered by ESP practitioners to overcome the challenge of teaching terminology.

3.1 Measures to deal with the challenge ESP terminology

Most of challenges encountered by teachers emerge from lack of ESP knowledge which is characterized by complex terminology. Even when teachers manage to acquire sufficient knowledge required to teach the course, they actually find it difficult to employ adequate pedagogical skills to efficiently represent content and make it accessible to students in ways that prepare learners for proper communication in their future professions. The facilitation theory suggested by Carl Rogers in the 1980's has strong foundations with ESP teaching contexts. Since ESP teachers lack specialized knowledge, they should not act as content experts, but as facilitators to provide learners with practical learning strategies. In order to improve pedagogical strategies of ESP teachers at university, ESP teachers need to collaborate with subject experts working at the same constitutions. This collaboration should characterize teaching strategies, classroom organization, and selection of teaching materials. Collaborative teaching can help ESP teachers seek good understanding of the specialized areas that ESP entails and choose appropriate strategies that facilitate terminology learning.

Furthermore, negotiation with learners can help ESP teachers gain valuable inputs since they, in different situations, master terminology and specialized technical concepts more than teachers. Interaction with learners can help teachers develop understanding of learners' perceptions about English and language learning as well as awareness about the sociocultural and environmental backgrounds that ESP learners bring with them to the classroom. With these perceptions, teachers can manage to tailor pedagogical teaching strategies in ways that accommodate students with various classroom needs and eventually create a motivating and positive learning experience. As such, ESP teachers need to be involved in learning about the particular field of study along with sociocultural awareness and social expectations. Interaction between students and learners doesn't only rest on the content knowledge, as it helps teachers understand the culture of learners and choose appropriate strategies that best represent content and terminology in a way that raises student's motivation to learn the language and develop pedagogy for teaching terminology. Further pedagogical strategies can be suggested to help teachers cope with the task of dealing with ESP terminology namely context and morphological analysis.

Jornlin (2015) acknowledged the role of context along with morphological analysis to assist learners discover the meaning of complex terms. Teachers can present Technical terms in a context such as a text related to the specific discipline and help learners use contextual clues such as definition, synonyms and illustration to infer the meaning of unfamiliar words. Since ESP learners are encountered with multi-morphemic complex words, teachers can equip learners with knowledge about word formation rules to be able to break complex terms into their meaningful unites (root, prefix, suffix) to decode the meaning of morphologically complex terminology. For effective ESP practice, teachers are in need for university support in terms of offering opportunities that allow for ESP professional development such as providing teachers with adequate ESP training and developing ESP oriented pedagogy that can be integrated in the ESP curriculum.

CONCLUSION

The increasing influence of English as an international language needed in various professions explained the need for ESP courses in the Algerian universities. However, teaching this area suffers a number of challenges that remain to be unresolved. This paper has brought to the fore some issues and challenges related to the knowledge base required for ESP teaching. Of these issues is teacher's lack of adequate pedagogical content knowledge related to the complex nature of ESP content and specialized terminology. As a result, many ESP teachers struggle for complete understanding of target materials, subject matter, and in class pedagogical strategies. This paper aims to contribute to the discussion on the knowledge needed for teaching ESP. It summarizes the scientific literature on the knowledge base of teachers with particular focus on PCK and its components in language education in general and ESP in particular. It stressed the significance of this construct in informing teaching practices and pedagogy required by teachers to serve their ESP learner's needs. It seems that just as ESP is distinct from English for general purposes, the professional knowledge of ESP practitioner differs considerably from the cognition of EGP teacher. PCK for ESP teaching requires subject matter knowledge of the specific discipline to which ESP is taught. Additional knowledge needed by ESP practitioner is related to the demanding roles that ESP teachers have to play such as, designing a course, developing materials and coping with technical terminology. Conceptualizing PCK in the context of English for specific purposes ESP teaching is a complex process that involves understanding of key underlying issues such as teacher's cognitions, beliefs and values and their role in shaping ESP teachers practices. Understanding the aspects of PCK can provide valuable instructional information to increase PCK of ESP teachers. ESP teachers need to understand how to unpack and present content so that students

can develop terminology as well as language skills to communicate effectively in their target professions. Research on teacher can be used for informing teacher policy and strengthening professional exchange. It entails specific suggestions for researching these topics across education systems.

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