3 Self-scaffolding and the role of new technologies in ESP teacher education

Irena Aleksić-Hajduković[1], Danka Sinadinović[2], and Stevan Mijomanović[3]

Abstract

This research aims to explore how English for Specific Purposes (ESP) teachers and practitioners utilise new technologies, e.g. Massive Open Online Courses (MOOCs), webinars, online platforms, etc. as a means of self-scaffolding in order to exceed their threshold in pedagogical, linguistic, and discoursal competencies in various ESP domains. The current study analyses the data provided by ESP teachers and practitioners from various educational backgrounds. The findings obtained via a questionnaire show to what extent ESP teachers and practitioners exploit new technologies as a means of self-scaffolding, but also offer a classification of the tools, strategies, and opportunities available for their self-directed professional development. Furthermore, various electronic self-scaffolding resources are discussed and evaluated according to their accessibility, applicability, and popularity among teachers. While this research is not concerned with cross-cultural differences in ESP teacher education, broadly speaking, it is concerned with gathering data from various teaching environments with a view to providing a universal representation of current trends in ESP teacher education. Offering an up-to-date model for ESP teacher education is an important implication of this research whose findings could serve as guidelines and contribute to material development.

1. University of Belgrade, Belgrade, Serbia; irena.aleksic@stomf.bg.ac.rs; https://orcid.org/0000-0002-1884-4784

2. University of Belgrade, Belgrade, Serbia; dankas78@gmail.com; https://orcid.org/0000-0002-3643-5917

3. University of Belgrade, Belgrade, Serbia; stevan.mijomanovic@gmail.com; https://orcid.org/0000-0002-2472-0016

1.   Introduction

The aim of this research is to explore how ESP teachers and practitioners utilise new technologies, e.g. MOOCs, webinars, online platforms, etc. as a means of self-scaffolding in order to exceed their threshold in pedagogical, linguistic, and discoursal competencies in various ESP domains. Although scaffolding in teaching ESP has been vastly investigated (Hirvela, 2013; Luzón, 2007; Sinadinović, Mijomanović, & Aleksić-Hajduković, 2019; Sobhy, Berzosa, & Crean, 2013; Tzoannopoulou, 2015), the role of scaffolding in ESP teacher education has been largely undermined.

Furthermore, the role of technology in teaching and learning English for Specific Purposes has been widely discussed (Bloch, 2013; Franklin-Landi, 2017; Muñoz-Luna & Taillefer, 2018) as technology facilitates the incorporation of authentic audio-visual materials that meet the needs of (future) medical practitioners, economists, civil engineers, etc. However, this paper focuses on the role of new technologies in ESP teacher education and argues that it is no longer possible to neglect their pivotal role in the improvement of ESP teachers' teaching competence on their own and at their own pace.

Some previous works have indicated that technology has a positive impact on mediating the process of teacher learning. For instance, Lantolf (2004) describes technology, such as the Internet and computer along with associated software, as a dependable source of *electronic-scaffolding* which has acted as a mediator in their learning processes, while positively affecting the professional development of teachers. Therefore, one of the key questions posed is: how can ESP teachers utilise new technologies to further improve their teaching competence across various ESP domains? In this paper, *new technologies* pertain to software, apps, MOOCs, etc. (see Section 3, Figure 3) that can help ESP teachers upgrade their subject-specific knowledge and enhance their professional development. The

paper attempts to provide some insights into this matter through the prism of the Vygotskyan notion of the Zone of Proximal Development (ZPD), which was later extrapolated to the Zone of Proximal Teacher Development (ZPTD) by Warford (2011) who used Sociocultural Theory (SCT) as a base.

According to Wood, Bruner, and Ross (1976), "the metaphor of scaffolding implies an educational concept in which a learner is equipped with tools and strategies that enable them to surpass their current developmental level and achieve goals within their range of competence" (p. 90). Integral to the notion of scaffolding is Vygotsky's (1978) theory of the ZPD, according to which "children's developmental potential is greatly improved through adult guidance and peer collaboration" (Santoso, 2010, pp. 47-48). Holton and Clarke (2006) state the following: "So for Vygotsky, a learner has an actual level of development and a potential for development. The difference between these two he called the zone of proximal development" (p. 128).

The conceptualisation of the ZPD and scaffolding provided by Holton and Clarke (2006), as opposed to *expert scaffolding* and *reciprocal scaffolding* that involve the aid of another person, i.e. the aid of an expert (e.g. a parent or a teacher) and a peer, respectively, *self-scaffolding* refers to an individual being in charge of their learning process in which they encounter new concepts and challenges.

Nonetheless, Warford (2011) argues that the ZPD could also be applied in the field of teacher education. As a result, the notion of the ZPTD has been explored by Warford (2011), who focuses on the distance between what teachers can do on their own and what they can achieve with the help of others (e.g. instructors, supervisors, etc.). Warford (2011) describes the ZPTD as "the distance between what teaching candidates can do on their own without assistance and a proximal level they might attain through strategically mediated assistance from more capable others (i.e. methods instructor or supervisor)" (p. 253). According to Warford (2011), there are four stages of the ZPTD: self- and teacher-assistance (Stages 1 and 2; initial), internalisation (Stage 3, advanced), and recurrence (Stage 4, advanced) (see Gallimore & Tharp, 1990; Warford, 2011).

This chapter proposes that the stages of the ZPTD should be redefined as new technologies can now take on the role of a mediator, although they cannot replace teacher training courses/programmes. The present research shows that ESP teachers are eager to use new technologies to communicate and exchange ideas or examples of good practice. This is actually reciprocal scaffolding that proves that ESP teachers do not depend on new technologies solely, but they are also likely to rely on their fellow-teachers for further advancement and support. The method section provides further information on the research design, selection of research tools, participants' profiles, and a brief overview of data analysis.

2.   Method

This research aims to explore how ESP teachers and practitioners utilise new technologies as a means of self-scaffolding in order to improve their competencies in various ESP domains. This study combining qualitative and quantitative approaches is based on a survey that consists of ten questions.

The survey was sent to various ESP teachers and practitioners coming from different countries and backgrounds. The survey, which was anonymous, was distributed in the virtual environment via ESP associations, organisations, and professional social media groups. A substantial number of participants worked in the business English domain (15). In the science, technology, engineering, and mathematics field there were 12 participants. There were eight participants in the domain of English for Medical Purposes and English for nurses, whereas seven participants deal with English for Academic Purposes. Apart from these, the following domains were represented in the survey: law (4), economics and management (3), education studies (2), maritime studies (2), English for Occupational Purposes (2), tourism (1), history (1), psychology (1), pharmacy (1), military studies (1), media (1), social sciences (1), agriculture (1), and applied arts (1).

Some of the participants worked in more than one field; therefore, all the responses were included. Some questions in the survey are open-ended, while others are closed-ended. Summative content analysis was conducted by

deploying qualitative and quantitative data analysis. The first part dealt with general information concerning the ESP domain, educational level, country where the participants worked and their affiliation, as well as their years of experience. The second part examined the utilisation of new technologies in ESP education including honing competencies, new technology resources, strategies, and opportunities available for their unassisted professional development. There were 50 responses in total (N=50).

3. Results and discussion

This section provides the analysis of the research results concerning participants' structure, electronic self-scaffolding resources available to ESP teachers, and the way they exploit new technologies in self-directed professional development.

3.1. Participants' structure

When it comes to the educational level at which they teach, four participants provided more than one answer (i.e. tertiary/in-company; tertiary/adults; secondary/tertiary; and secondary/online). Most of the participants taught English at tertiary level (46), four participants worked at secondary level, two participants taught adults, one participant stated that they worked in-company, and one participant stated they worked online.

Table 1 shows the distribution of our participants across countries, i.e. where they teach. It can be noticed that teachers from 20 different countries took part in our survey while participants from Serbia, Poland, the US, and Russia were most represented. The majority of participants came from Europe, but teachers from four other continents participated as well.

Figure 1 illustrates how long the participants have been teaching in the field of ESP. It can be noticed that the majority of participants are highly experienced – 66% of all the participants have been teaching for between 11 and 31 years and there are only 8% of teachers who have been teaching for up to five years.

Table 1. Countries where the participants teach

Country	Number (%)	Country	Number (%)
Serbia	14 (28%)	Mexico	1 (2%)
Poland	8 (16%)	Montenegro	1 (2%)
US	7 (14%)	Romania	1 (2%)
Russia	3 (6%)	Saudi Arabia	1 (2%)
Brazil	2 (4%)	Slovenia	1 (2%)
India	2 (4%)	Spain	1 (2%)
Algeria	1 (2%)	Switzerland	1 (2%)
Egypt	1 (2%)	Turkey	1 (2%)
Japan	1 (2%)	Ukraine	1 (2%)
Latvia	1 (2%)	Vietnam	1 (2%)

Figure 1. Experience in teaching ESP (number of years)
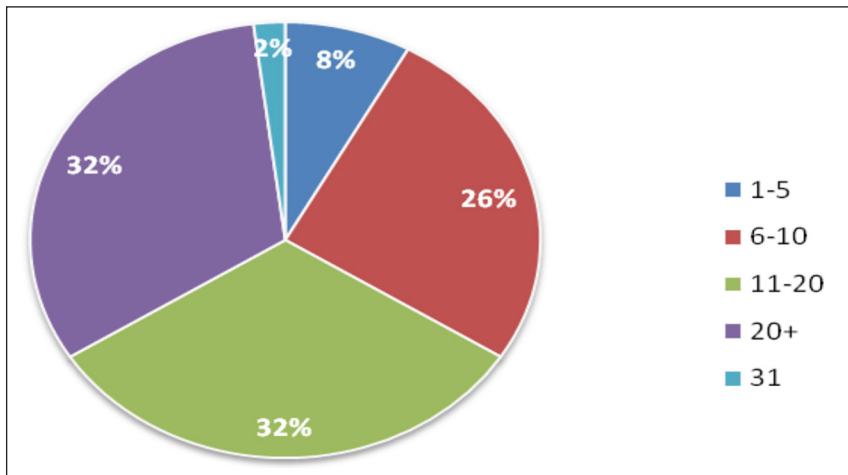
3.2. Self-scaffolding resources

Figure 2 shows in what context (private/public sector, institution/independent, etc.) our participants teach ESP. The results of the survey indicate that the majority of the participants teach at public universities (31). However, there is a significant number of those who are affiliated to private universities (14). Apart

from public and private universities and schools, there are a few participants who teach at a workplace (i.e. companies) and very few teachers who are engaged in private tutoring or teaching online. For this question, the participants could provide more than one answer, which four of them did (secondary level/online lessons/tutoring; secondary level/primary; secondary level/college; and tertiary level/in-company).
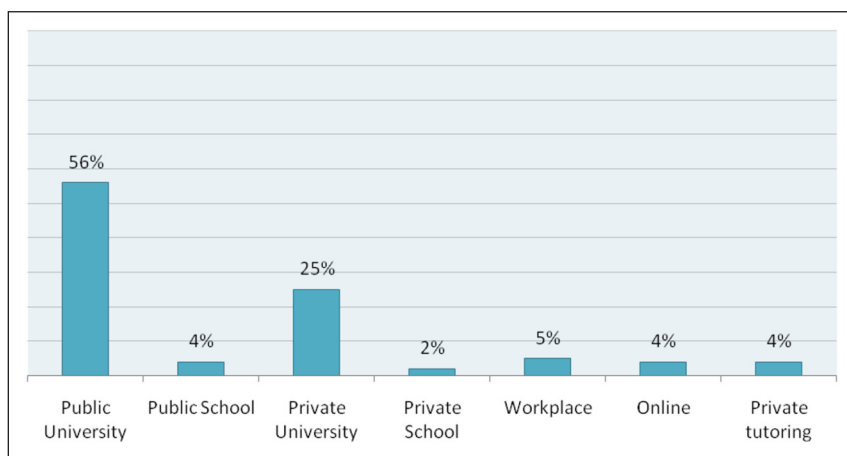
Figure 2.   The distribution of the respondents' affiliations

Table 2 shows to what extent the participants agree with the given statements designed to explore the reasons behind using new technologies. In this section, the participants were given five statements and evaluated each statement by choosing the answer they considered the most appropriate on a five-level Likert-type scale (1=I strongly disagree, 5=I entirely agree). Participants were asked if they used new technologies in order to: gain knowledge in their ESP domain (Statement 1); exchange ideas with other colleagues from their ESP domain (Statement 2); and improve their linguistic competences in their ESP domain (Statement 3). It was also checked whether they found new technologies that could improve their ESP teaching competencies to be easily accessible (Statement 4), and if it was easy to find out about new technologies that were compatible with their ESP domain (Statement 5). The answers to these questions

were analysed using descriptive statistics, and our main focus was on the most positive and the most negative answers to every single question.

As can be seen from the answers to Statement 1, 46% of the participants believe they use new technologies for gaining knowledge in their ESP domain. Interestingly, none of the participants strongly disagreed with this statement, whereas 16% of them disagreed. Similarly, 34% of all the participants claim they use new technologies for exchanging ideas with their colleagues while only 6% of all the participants never seem to do that. Only 4% of all the participants believe they never use new technologies for improving their linguistic competencies in their ESP domain, whereas 38% of the participants think they definitely use new technologies to this purpose. So, analysing these three statements, it can be concluded that new technologies are used to a great extent and that the participants are well aware of them. The remaining two statements (Statement 4 and Statement 5) are predominantly evaluated using the most neutral value on Likert-type scale. Only 18% of all the participants entirely agree with the statement that new technologies that could improve their ESP teaching competencies are easily accessible, while only five participants (10%) entirely agree that it is easy to find out about new technologies they could use. So, it could be said that the participants in our research use new technologies to a rather great extent and that they do so to various purposes, but that they do not find particular new technologies accessible enough and easy to get informed about.

Table 2.   Electronic self-scaffolding resources in ESP teacher education

STATEMENT	1	2	3	4	5
I use new technologies for gaining knowledge in my ESP domain.	0%	16%	18%	20%	46%
I use new technologies for exchanging ideas with other colleagues from my ESP domain.	6%	20%	20%	20%	34%
I use new technologies for improving my linguistic competences in my ESP domain.	4%	18%	16%	24%	38%
New technologies that could improve my ESP teaching competences are easily accessible.	6%	14%	40%	22%	18%
It is easy to find out about new technologies that are compatible with my ESP domain.	10%	14%	44%	22%	10%

3.3. New technologies in self-directed professional development of ESP teachers

When asked how they get informed about new technologies online, the participants stated it was mainly through professional development courses and professional communication. In the online category they listed searching/browsing the Internet (e.g. Google, Google Scholar), social and professional networks (e.g. Facebook, LinkedIn), specialist sites, and university websites. Professional development entails membership in professional organisations – e.g. Teaching English to Speakers of Other Languages (TESOL) –, webinars, MOOCs, attending courses, conferences, workshops, classes, and reading professional/vocational papers. Finally, when it comes to professional communication, what they particularly point out is professional exchange, followed by word of mouth (i.e. colleagues, students), online teaching communities, newsletters, and mailing lists.

Undoubtedly, our participants are quite eager when it comes to self-development and quite versatile in their approach to it. What is striking is the fact that they mostly rely on sources that either presuppose self-scaffolding or reciprocal scaffolding. However, most of the responses imply that they heavily rely on professional communication as a primary source of information.

Figure 3 demonstrates what new technologies the participants use for their self-directed professional development in their ESP domain. Online platforms (e.g. YouTube, TED-Ed, etc.) were obviously the most frequently chosen. These are followed by professional ESP websites, webinars, and social networks. Participants also made their own suggestions listing university online courses, educational websites aimed at professionals, and seminars for professional development.

The new technology resources that our participants listed as their favourite could be divided into 16 different categories: (1) publishers' websites and dictionaries, (2) online platforms, (3) online libraries, (4) webinars, (5) workshops, (6) file hosting services, (7) tools, (8) websites for e-learning/professional sites, (9) MOOCs, (10) e-books/online magazines, (11) professional associations' websites, (12) research engines, (13) discussion boards, (14) blogs, (15) podcasts, and (16) equipment.

Figure 3. New technologies used for self-directed professional development of ESP teachers
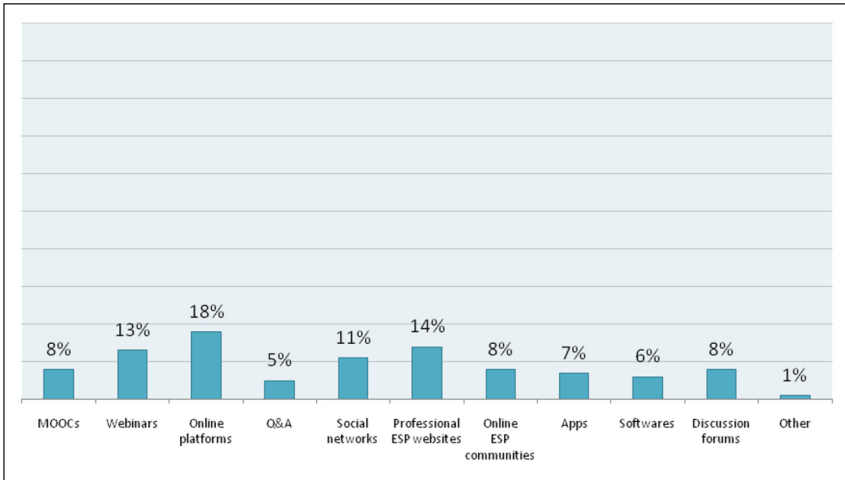
Oxford University Press, Pearson, and British Council resources were mentioned within Category 1, as well as free online dictionaries and online lexicons. Apart from the universally popular platforms such as YouTube and TED, the participants also mentioned platforms with instructional content including Newsela and Edmondo. JSTOR was listed as an example of an online library, while webinars hosted by Besingheim and Slovene Association of Language for Specific Purposes (LSP) Teachers were listed within Category 4. Electronic Village Online by TESOL was mentioned as an example of a workshop, whereas Dropbox and Google Drive represent Category 6. The participants were most elaborate regarding Category 7 as they listed MarEng (Maritime English tool), and the Windows photo story programme, besides the following apps: Quizlet, Kahoot, Pustulka.

The software the participants use include Powtoon, Turnitin, Infographics, Seagull software, ActivePresenter, Padlet, and language softwares, along with PowerPoint. KenHub, Cnet, open educational resources, ViDEOTEL, getnewsmart (business), history.com, studylegalenglish.com, become.

legalenglishexpert.pl, medical animation sites (e.g. xvivo), and Wikis were among those most mentioned in the category of websites for e-learning/ professional sites. The category of MOOCs was illustrated by Future Learn and Canvas, whereas ELTA, Consortium on Graduate Communication, and TESOL's ESP can be classified as professional associations' websites.

The mere number of the categories obtained by answering this question proves the importance and ubiquity of new technologies, not only for general teacher development, but for ESP teacher development. On the one hand, a considerable number of our participants still resort to the more traditional resources such as books and dictionaries even though these resources can now be found online in a format that fuses the old and the new. However, there is a predominance of fairly new inventions (e.g. MOOCs) that are being used as teaching tools and self-development tools at the same time. We can also observe that e-learning/ professional websites and online platforms represent common resources for improving one's teaching competencies in ESP. This might suggest a lack of formal courses or degrees that are specifically tailored for the existing variety of ESP teachers (e.g. Maritime English, Medical English, etc.).

Furthermore, the results suggest that ESP teachers might need additional skills and know-how in the future. The bulk of our participants use a variety of apps and software programmes, some of which require their users to be technologically savvy or to devote a fair amount of time to grasp the basic functions. Finally, the reliance on the professional community is evident, nevertheless, the arena is becoming increasingly virtual in nature.

Finally, when asked how they use new technologies to further develop their teaching competencies in their ESP domain, the participants provided answers that could be organised into five different categories: (1) self-study, (2) self-development, (3) information exchange, (4) classroom use, and (5) testing.

Regarding the self-study category, the participants use new technologies to find relevant literature as resources and references to be updated in their ESP domain, to deepen their knowledge of the domain, to read, learn new skills, watch

videos and tutorials, and update and broaden their competencies in (business) terminology.

In the self-development category they use new technologies to access webinars (Oxford University Press), web conferences, discussion forums (TESOL), and professional ESP websites (TESOL) to get practice and experience, to develop their linguistic competencies, to search how to use new technologies, to apply professional programmes in expanding their specialist knowledge, to learn new skills, for continual professional development, to acquire the latest pedagogical tools to improve their teaching, and to update and broaden their competencies in business terminology.

For information exchange, our participants use new technologies to share information with students/colleagues, for professional exchange, to access news feeds from social network groups and discussion forums (TESOL). The participants use new technologies in the classroom to access/find relevant material e.g. videos, as source material for lessons/course development, for development of their students' linguistic competencies, to search for activities that can be used with students, to assign tasks, to introduce new approaches for teaching 'old' things (e.g. using an interactive whiteboard), for using videos in the classroom (e.g. pronunciation drill), for development of activities based on video content, for recording micro teaching sessions and their discussion and evaluation with students, and for skills development.

Finally, for testing, our participants use new technologies to develop their own web based applications for ESP.

The participants also use online platforms, MOOCs, apps, and online courses. All of these are used for self-study and self-development. Online platforms, MOOCs, and apps are used in the classroom, and online platforms and apps are used for information exchange and testing.

As regards self-study, we can see that the emphasis is placed on obtaining new information and deepening the knowledge within a particular domain, while the

self-development category adds honing both linguistic and non-linguistic skills including pedagogical and technological skills, as well as the acquisition of new tools. Even though the third category is self-explanatory, it is evident that new technologies are used as an easier and faster way of communication with students and with the professional community. The fourth category shows us how new technologies are used for finding materials and activities for class use, for honing skills, course development, and for developing student's linguistic competencies. Finally, not only do our participants use new technologies for the purpose of testing, but they also take part in developing them. It is interesting to note that a few of these appear in almost every category. For instance, online platforms and apps are included in all the categories, whereas MOOCs are mentioned in three (self-study, self-development, and classroom use), and online courses in two (self-study and self-development). Another important fact is that there are these five groups in particular, rather than some other combination. Therefore, we propose that new technologies actually serve as electronic-scaffolding (*e-scaffolding*) that can be further broken down into self-scaffolding (self-study and self-development), reciprocal scaffolding (information exchange), and as a source of pedagogical tools.

4.   Conclusions

This research has provided ample evidence of how ESP teachers and practitioners utilise new technologies. ESP teachers have demonstrated an insatiable need to enhance their teaching competencies by turning to new technologies (i.e. MOOCs, software, apps, etc.). The research has shown that ESP teachers use new technologies to a rather great extent and that they do so for various purposes, even though they do not always find them easily accessible or simple to use.

Furthermore, the data indicate that e-learning/professional websites and online platforms represent common resources for improving one's teaching competencies in ESP. This might suggest a lack of formal courses or degrees that are specifically tailored for the existing variety of ESP teachers.

Most importantly, this research highlights the need to redefine the outdated model of the ZPTD by acknowledging *e-scaffolding* as the fifth stage of the ZPTD that co-exists with the other four stages defined in the 1990s when the new technologies had just started to emerge.

Offering an up-to-date model for ESP teacher education is an important implication of this research whose findings could serve as guidelines and contribute to materials development.

Finally, the limitations of this research are cross-cultural differences in ESP teacher education, which are beyond the scope of the research. Nevertheless, this paper provides a universal representation of current trends in ESP teacher education and the role of new technologies in unassisted professional development of ESP teachers. Further research is well-advised in order to explore field specific nuances, cultural differences, and (in)accessibility to new technologies investigated in the paper, including financial and institutional aspects.

Acknowledgements

References

Bloch, J. (2013). Technology and ESP. In B. Paltridge & S. Starfield (Eds), *The handbook of English for specific purposes* (pp. 385-401). John Wiley & Sons.

Franklin-Landi, R. (2017). Identifying and responding to learner needs at the medical faculty: the use of audio-visual specialised fiction (FASP). In C. Sarré & S. Whyte (Eds), *New developments in ESP teaching and learning research* (pp. 153-170). Research-publishing. net. https://doi.org/10.14705/rpnet.2017.cssw2017.750

Gallimore, R., & Tharp, R. (1990). Teaching mind in society: teaching, schooling, and literate discourse. In L. Moll (Ed.), *Vygotsky and education: instructional implications and applications of sociohistorical psychology* (pp. 175-205). Cambridge University Press. https://doi.org/10.1017/cbo9781139173674.009

Hirvela, A. (2013). *ESP and Reading.* In B. Paltridge & S. Starfield (Eds), *The handbook of English for specific purposes* (pp. 77-94). John Wiley & Sons. https://doi.org/10.1002/9781118339855.ch4

Holton, D., & Clarke, D. (2006). Scaffolding and metacognition. *International Journal of Mathematical Education in Science and Technology, 37*(2), 127-143. https://doi.org/10.1080/00207390500285818

Lantolf, J. P. (2004). Overview of sociocultural theory. In O. S. John, K. van Esch & E. Schalkwijk (Eds), *New insights in second language learning and teaching* (pp. 13-34). Peter Lang Verlag.

Luzón, M. J. (2007). Enhancing WebQuest for effective ESP learning. *CORELL: Computer resources for language learning, 1*, 1-13. https://www.ucam.edu/sites/default/files/corell/MJLuzon.pdf

Muñoz-Luna, R., & Taillefer, L. (Eds). (2018). *Integrating information and communication technologies in English for specific purposes.* Springer International Publishing. https://doi.org/10.1007/978-3-319-68926-5

Santoso, A. (2010). *Scaffolding an EFL (English as a foreign language) 'effective writing' class in a hybrid learning community.* Doctoral dissertation. Queensland University of Technology.

Sinadinović, D., Mijomanović S., & Aleksić-Hajduković, I. (2019). Instructional scaffolding in English for Medical Purposes: towards enhancing a student-centred approach in large classes. In *Proceedings from LSP '18: The Third International Conference from Theory to Practice in Language for Specific Purposes.* Association of LSP Teachers at Higher Education Institutions.

Sobhy, N. N., Berzosa, C., & Crean, F. (2013). From ESP to CLIL using the schema theory. *LFE: Revista de lenguas para fines específico*s, *19*, 261-278.

Tzoannopoulou, M. (2015). Rethinking ESP: integrating content and language in the university classroom. *Procedia-Social and Behavioral Sciences*, *173*, 149-153. https://doi.org/10.1016/j.sbspro.2015.02.045

Vygotsky, L. (1978). Interaction between learning and development. *Readings on the development of children*, *23*(3), 34-41.

Warford, M. (2011). The zone of proximal teacher development. *Teaching and Teacher Education, 27*(2), 252-258. https://doi.org/10.1016/j.tate.2010.08.008

Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of child psychology and psychiatry, 17*(2), 89-100. https://doi.org/10.1111/j.1469-7610.1976.tb00381.x

ESP teaching and teacher education: current theories and practices
Edited by Salomi Papadima-Sophocleous, Elis Kakoulli Constantinou, and Christina Nicole Giannikas