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Research Paper

Towards a Quality Standardized Technological Education in Spain: A Case Study With EFL Preservice Teachers

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Abstract

This case study draws from the imperative to integrate technology under international quality standards in preservice English language teacher education in Spain. To meet this requirement, the study intended to explore preservice EFL teachers' actual needs regarding initial teacher training on technology in Spain. With this objective in mind, we developed a questionnaire based on the technological pedagogical content knowledge (TPACK) framework (Mishra & Koehler, 2006) for blending content, pedagogy, and technologies along 3 main dimensions. Against our initial expectations, technological content skills were self-reported as high. Nevertheless, we identified a need for further training in pedagogical skills and pedagogical content skills as much as for specific EFL teaching tools and applications to support the teaching and learning activities.

Keywords: TPACK; Curriculum; Technology Integration; EF; Preservice Teacher Education.

1. Introduction

The recent importance acquired by the Knowledge and Information Society (IKS) makes it increasingly necessary to transform how we work, communicate with others, engage in politics, or identify our country's economic and social development needs (Gómez-Trigueros et al., 2019; Martín & González, 2018; OECD, 2018). Therefore, world citizens need to have access to and receive training in and with new technologies to achieve academic and professional goals globally. Thus UNESCO (2017) supports the development of national policies and general plans for using information and knowledge technologies (ICT) in education, helping governments channel the potential of technologies in education systems to achieve Sustainable Development Goal 4—Education by 2030.

In this vein, the European Commission has developed the Digital Competence Framework for Citizens (DigComp), describing five critical areas of digital competence: (i) information and data literacy, (ii) communication and collaboration, (iii) digital content creation, (iv) safety, and (v) problem solving (Vuorikari et al., 2022). More specifically, the European Framework for the Digital Competence of Educators (DigCompEdu) focuses on educators at all levels of education (and provides a) reference frame for developers of digital competence models (Redecker & Punie, 2017). Along these lines, other strategic frameworks at the European and national levels (European Commission, 2020; European Parliament, 2018; Ferrari, 2013; INTEF, 2017; Redecker & Punie, 2017) have favored the design and implementation of specific ICT plans to respond to teacher digitalization competence demands. Some of the most relevant plans in Spain are Cultura digital en la escuela, [translation: Digital Culture at School], 2013; Marco estratégico de desarrollo profesional docente, [translation: Strategic Framework for Professional Teacher Development], 2013; and Educa en digital, [translation: Educate in Digital], 2020.

In the Spanish context, teachers' digital competence has been approached, among others, by Esteve-Mon et al. (2020), Rodríguez-Moreno et al. (2021), and Pozo-Sánchez et al. (2020). Their studies unveil gender and teaching expertise as crucial variables. More specifically, the digital competence of in-service teachers of English has been

addressed by Blanco-González and Mañoso-Pacheco (2021). They concluded that despite receiving specific training in these skills, in-service teachers of English continue to need more support and technical equipment. In line with Blanco-González and Mañoso-Pacheco (2021), Palacios-Hidalgo et al. (2022) explored the self-perceived digital literacy of preservice EFL and bilingual education teachers and concluded insisting on the need for specific initial teacher training in digital competence.

These previous research results are determined by the need for a predetermined syllabus designed under international technology standards, which leaves technology integration unaddressed in preservice English language teacher education programs in Spain. Nor do we know enough about preservice EFL teachers' actual needs regarding initial teacher training on technology in Spain.

On this basis, the present study aimed at exploring 24 preservice English teachers' self-reported

- Technological, pedagogical, content knowledge, general skills
- Technological, pedagogical, content knowledge-based education received, and level achieved
- ELT specific technological challenges they face when including technologies in their future English teaching classrooms
- General and ELT specific technological preferences

The ultimate goal of this study was to address the significant need for preservice English language teacher education programs in Spain to incorporate technology integration into their curriculum, in alignment with international technology standards. The study sought to fill the existing gap by understanding the actual needs of preservice EFL teachers concerning their initial training in technology.

2. Technology Integration Into Educational Settings: TPACK

The use of technology continues to be a subject of study on language education worldwide due to the rapid advancements in digital technologies and their implications for language education (Howard et al., 2021; Rivera-Vargas et al., 2017). However, as Ekmekçi (2023) points out, this use can no longer be considered a teacher choice or something just to be integrated into the curriculum (DelliCarpini, 2012). Language teachers need to have digital, pedagogical, and content competencies and, most importantly in the case of preservice teachers, they need to know how to integrate them in the language classroom. The technological pedagogical content knowledge (TPACK) model assumes that the right use of technology depends on teachers' digital, pedagogical, and content competences (Mishra & Koehler, 2006).

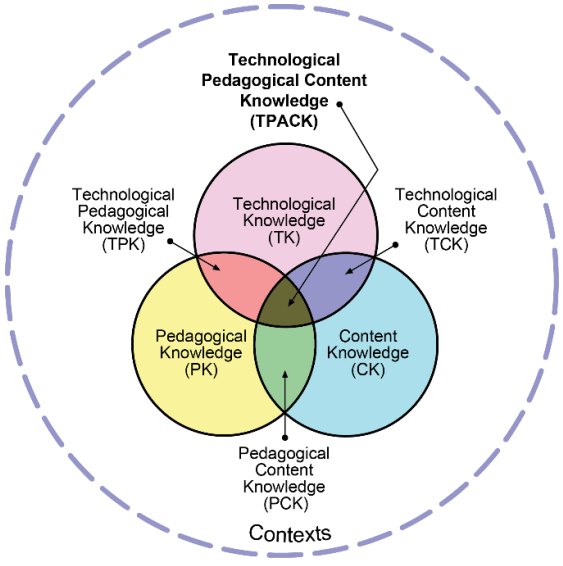

Figure 1. Components of the TPACK Image (Reproduced by permission of the publisher, © 2012 by tpack.org)

Teachers need to have pedagogical knowledge (PK), knowledge of the subject they teach (CK), and technological knowledge (TK) to acquire deep teaching knowledge (Mishra & Koehler, 2006). Moreover, the TPACK teaching and learning framework revolves around the appropriate inclusion and use of technology in education, stressing the importance of simultaneously activating CK, PK, and TK in the teaching and learning process (Gómez-Trigueros et al., 2019; Ortega Sánchez & Gómez-Trigueros, 2019).

TPACK is particularly useful in initial teacher education. It focuses on training in instrumental competencies and their interrelation with the didactic component, helping teachers develop changes in procedures concerning technologies (Gómez-Trigueros et al., 2019). The model proposes a reflective action when approaching educational work, helping to meditate the teacher's training to enable them to participate in self-knowledge and self-development processes in didactic practice (Ortega Sánchez & Gómez-Trigueros, 2019). The focus is on training in the teaching and learning with technologies process.

Based on the developments and considerations explained above, the present study aimed at answering the following specific research questions comprising both a descriptive and an explanatory dimension:

1. What are our preservice teachers' self-perceived TPACK general skills?
2. What is our preservice teachers' self-perceived level of TPACK-based education received and the level achieved?
3. What are our preservice teachers' self-perceived ELT-specific technological challenges when including technologies in their future ELT classrooms?
4. What are our preservice teachers' general and ELT-specific technological preferences?

3. Material and Methods

The overall research design of the study was descriptive, exploratory, and noninterventionist. We adopted a mixed-method approach to investigate the opinions of preservice EFL teachers regarding their initial technology training in Spain, as well as their technological challenges and preferences. The choice of a mixed-method methodology was deemed the most suitable for this research, as it allowed us to gain a more comprehensive understanding of the research topic. This combination of methods not only enhanced the validity of our findings but also provided us with rich, detailed insights into human experiences and emotions.

3.1. Participants

The study involved 24 preservice teachers from the master's program in TEFL at Universidad Complutense de Madrid (UCM) between 2021 and 2022. This state university offers a wide range of programs and is renowned for its academic excellence in Spain (https://ucm.es/). The master's program in TEFL is specifically designed to equip aspiring educators with the indispensable skills and knowledge required for effective teaching. It places a strong emphasis on pedagogy and educational theory, providing a comprehensive grasp of modern teaching methods and strategies. The successful completion of the master's in teacher training is a sine qua non requirement for any teacher, regardless of their specialization, to be able to teach in any public, private, or subsidized secondary education institution in the Spanish territory.

The master's admission rates are 8.3%. This explains that all the participants, aged between 22 and 25, were highly qualified English graduates with proficient English levels ranging from C1 to C2, according to the Council of Europe (CEFR, 2001). As part of the study, we asked them to complete a TPACK questionnaire and contribute to a classroom repository of useful apps and Websites to integrate technologies into the English classroom. Participation in the research was optional and anonymous, and the participants were fully informed about the research procedures before they consented to participate. Participation was optional and did not affect the students' final grades.

3.2. Research Instrument

To gather information regarding the technological knowledge and skills of preservice English teachers, a self-developed questionnaire was meticulously crafted. This instrument is anchored in the TPACK framework (Mishra &

Koehler, 2006), which integrates content, pedagogy, and technology across three pivotal dimensions: technological content knowledge (TCK), technological pedagogical knowledge (TPK), and TPACK. After a thorough analysis of questionnaires previously devised by other TPACK researchers, including Chaaban and Ellili-Cherif (2016), Ekmekçi (2023), Chuang et al. (2015), Schmidt et al. (2009), and Sun et al. (2017), we structured a tailored questionnaire specifically for the preservice English teachers at UCM. This questionnaire encompasses four principal sections:

Section 1, based on a Likert scale and consisting of 14 items, focuses on our students' TPACK skills and tackles aspects related to their self-perception of their technological knowledge of the content (items 1-5), their pedagogical technological knowledge (items 6-10), their pedagogical technological knowledge of content (items 11-12), and the formation/education they have/have received to integrate technology into English language teaching, also expressed through their self-perceived TPACK leadership capacities (items 13-14).

Section 2 focuses on their challenges in integrating technologies into the English classroom and provides them with ten potential challenges to identify and tick.

Section 3 draws on preferences and comprises two lists of English teaching apps and Websites for our preservice teachers to tick, and four open questions regarding the technologies they commonly use in their daily lives, the technologies they feel more confident using during their English teaching practice, the apps or Websites for English teaching they know and would recommend other teachers to use, and their opinion about their need for additional formation on how to integrate technology into their teaching practice.

Section 4, consisting of an open question, explores their feelings about integrating technology into the English classroom.

The internal consistency of the questionnaire was calculated using IBM SPSS Statistics for Windows (version 25.0). The Cronbach's alpha coefficient obtained was 0.86, which means that the questionnaire was reliable (de Vellis, 2003). Before being used, the questionnaire was piloted with five university students to improve clarity. To guarantee reliability, additional modifications were introduced following piloting.

4. Results

Regarding research questions 1 and 2, dealing with the preservice teachers' self-perceived level of TPCK skills and their level of training in TPCK skills, the data obtained from the first section of the questionnaire were analyzed. Notably, a descriptive analysis was carried out to assess the level of their TPCK skills in terms of TCK skills (questions 1-5), TPK skills (questions 6-10), TPCK skills (11-12), and TPCK formation skills (13-14). The raw data from each set of items was condensed and recorded into a new variable with a verbal descriptor (low – moderate – high).

As shown in Table 1, more than 58% of the participants self-reported having a high level of TCK skills when dealing with technological content skills. In comparison, almost 42% of them admitted having a moderate level. In the case of technological pedagogical skills, the results were slightly lower, with 4.2% of the students stating having a poor command of TPK skills, 66.7% admitting a moderate level of command, and 29.2% having a high level. Similar results were obtained for TPCK skills, with 4.2% of the respondents declaring having a low level of TPCK skills, 62.5% a moderate level, and 33.3% a high level:

Table 1. *Preservice Teachers' General Perception of Their Command of TPCK Skills*

Technological Content Skills			
Valid Percent	Disagree	Undecided	Agree
I can identify suitable topics to be taught with technology in ways that add value of technological tools as to help student comprehend the topics.	4.2%	8.3%	87.5%
I can identify suitable topics to be taught with technology in ways that add value of technological tools as to teach students effectively.	0%	16.7%	83.3%
I can choose technologies to use in my classroom that enhance the content for a lesson.	0%	20.8%	79.2%
I can identify appropriate representations with technologies to transform content comprehensible to learners.	0%	20.8%	79.2%

I can identify appropriate representations with technologies to transform content which is difficult to be supported by traditional means.	8.3%	8.3%	83.3%
Technological Pedagogical Skills			
I can choose technologies to use in my classroom that enhance the teaching approaches for a lesson.	8.3%	12.5%	79.2%
I can identify appropriate strategies for the infusion of technology in the classroom to put the learners at the center of the learning process to observe, explore and inquire.	8.3%	12.5%	79.2%
I can identify appropriate strategies for the infusion of technology in the classroom to put the learners at the center of the learning process to collaborate with others.	8.3%	12.5%	79.2%
I can identify appropriate strategies for the infusion of technology in the classroom to put the learners at the center of the learning process to resolve cognitive conflict and problem solve.	12.5%	33.3%	54,1%
I can identify teaching strategies difficult to be implemented by traditional means without technology.	12.5%	25%	62.5%
Technological Pedagogical Content Skills			
I can choose technologies to use in my classroom that enhance what I teach, how I teach, and what students learn.	4%	12%	84%
I can teach lessons that appropriately combine content, technologies, and teaching approaches.	7,7%	15,4%	76,9%

However, when asked about their training on TPCK skills, 25% of the respondents self-reported to have received poor training on developing their TPCK skills, followed by 54.2% with a moderate and 20.8% with a high level of training received. Interestingly, if analyzing each of the items included in this section, 66.7% of the respondents agreed to have received, or be receiving, education on TPCK skills, whereas only 29.2% admitted their leadership capacities (see Table 2). This fact is rather surprising, as no formal training on TPCK skills is being provided in the master's course:

Table 2. *Preservice Teachers´ Perception of TPCK Education Received and Level of Expertise Achieved*

Valid Percent	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
I have received/am receiving education that has caused me to think more deeply about how technology could influence the teaching approaches I use in my classroom.	4.2%	8.3%	20.8%	29.2%	37.5%
I can provide leadership in helping others to coordinate the use of content, technologies, and teaching approaches at my school and/or district.	8.3%	25.0%	37.5%	12.5%	16.7%

Regarding research question 3, dealing with the preservice teachers' ELT specific technological challenges when including technologies into their future ELT classrooms, the data from section 2 were analyzed, corresponding to 10 yes/no challenge-based questions. The descriptive analysis was carried out to calculate the frequency of positive/negative answers for each of the statements. If analyzing the most problematic issues, as seen in Table 3, the most challenging tasks seem to be related to the 'not having' items: preservice teachers' lack of time for preparing TPCK lessons (54.2%), for learning to prepare TPCK lessons (45.8%), and 'not having' technical (45.8%) and administration support (45.8%). Interestingly, the 'not knowing challenges' were perceived as much less demanding by most of the respondents. The only exception here was the 'not knowing how to find suitable texts and materials online' item, with 37.5% of the respondents identifying this as a challenge:

Table 3. *Preservice Teachers' Perception of TPCK Challenges*

	Frequency	Percent
"Not Knowing" Challenges		
Not knowing how to use technology	5	20.8%
Not knowing how to integrate technology in your teaching practice	3	12.5%
Not knowing how to find suitable teaching texts and materials online	9	37.5%
Not knowing how to implement online teaching texts and materials	5	20.8%
"Not Having" Challenges		
Not having time to prepare lessons that integrate technology in your teaching practice	13	54.2%
Not having time to learn to prepare lessons that integrate technology in your teaching practice	11	45.8%
Not having the means and resources to learn to prepare lessons that integrate technology in your teaching practice	9	37.5%
Not having technical support	11	45.8%
Not having administration support	11	45.8%

To answer question 4, section 3 was analyzed, consisting of two lists of English teaching apps and Websites (17 general teaching apps and 54 ELT teaching apps), as well as 4 open questions, all of which aimed at collecting the students' opinions on the technologies they use on their daily lives and their application for teaching and English language teaching purposes.

Regarding the most recognizable general teaching applications, prezi.net ended up being the favorite for over 90% of the students, followed by padlet.com, kahoot.com, and slideshare.net (between 60% and 80%) and hangouts.com, quizlet.com, elmondo.com, socrative.com (between 30% and 60%). Curiously, 29.4% of the apps/Websites from the list were not recognized by any students.

Regarding ELT apps and Websites, bbc.co.uk was identified by 83.3% of respondents, followed by ted.com (79.2%) and soundcloud.com (66.7%). Other popular apps included esl-lab.com, audacityteam.org, teachingenglish.org, history.com, scribel.com, owl.purdue.edu, and breaking newsenglish.com (between 25-35%). Interestingly, 40.7% of the teaching apps/Websites from the list were not recognized by any of the students. Among them, we can find popular teaching Webs/apps, such as ello.org, voki.com or speakpipe.com.

To complete the information retrieved from the quantitative analysis and further explore our students' perceptions about integrating technology in the EFL classroom, we asked the respondents to provide their general opinion on incorporating technology in the EFL classroom, as well as comment on the main challenges and preferences when teaching languages with technology. Qualitative data from their responses were analyzed using an inductive approach to identify similar patterns. The students' responses, subject categories, frequencies, and a selection of relevant comments are presented in Table 4. Qualitative data confirm the high importance given to technology, with 95.8% of the respondents recognizing the increasing role of ICT in language teaching. They emphasized the benefits of technology related to its ability to engage students in the teaching-learning process (41.7%), providing a wide range of new opportunities for language teaching (37.5%), as well as connecting learners with digital reality (29.2%).

The results endorse the quantitative research findings regarding the significant challenges our preservice teachers deal with. In terms of 'not knowing' challenges, the respondents were particularly concerned about the effective way to integrate technology in the classroom (12.5%), whereas the 'not having' challenges were mainly related to lack of time and administrative support (12.5%). Regarding our preservice teachers' preferences when using technology in the EFL classroom, very few teachers (8.3%) commented on the issue. Kahoot, Prezi, Canva, and Padlet were the most frequently used specific tools:

Table 4. *Preservice Teachers' Perception on Integrating Technology in the EFL Classroom*

Categories, Frequencies, and a Selection of Relevant Comments		
Increasing Importance of Technology - 95.8%		
Technology as a way to engage students	41.7%	*I believe it is a great opportunity to motivate and engage students to reinforce any previous activity or lesson done in class. It also increases participation and is a source of knowledge. It may help teachers to vary the activities done in a lesson.* *I think technology is essential everywhere. We live in a digitalized world, so why not make English learning part of our digital reality as well. Students could find an online*

		tool that really works for them, or that they really like. This would enhance their learning experience. *Society is constantly changing and evolving, and the integration of new technologies is useful and compulsory since teachers should apply and use what it is being used in real life. If your students have an addiction because of tiktoks maybe, you should include them so that they are more interested. Technologies are supposed to help and make our lives better, so implementing them in education maybe makes the process easier. In order to use technologies teachers should receive instructions.*
Technology as a new method of teaching with a wide range of opportunities	37.5%	*I honestly think that it is very useful to enhance both teaching and learning due to the wide range of possibilities technologies offer nowadays* *English teaching can be more interesting and effective thanks to technology since it provides a new and appealing method for students. There are some drawbacks such as the time that it has to be spent selecting the materials and topics but it is absolutely worth it.* *From my point of view, it is essential to include technology at school in order to learn because students are constantly using it to communicate, to be informed about what's going on in the world and to look for information when they don't understand something. For this reason, integrating technology into classroom can be extremely beneficial. On the other hand, they may come across other ways of learning English. Furthermore, we could teach them better about different cultures and varieties, which might help them overcome their self-consciousness when speaking another language.*
Technology as a reflection of the society/students are digital natives	29.2%	*Society is constantly changing and evolving, and the integration of new technologies is useful and compulsory since teachers should apply and use what it is being used in real life. If your students have an addiction because of tiktoks maybe you should include them so that they are more interested. Technologies are supposed to help and make our lives better, so implementing them in education maybe makes the process easier. In order to use technologies teachers should receive instructions.* *I think it is very important to integrate technology in the classroom environment as it is undeniable that technology is taking over the world and people. For that reason, I think that we have to leave behind the traditional teaching methods and embrace the new technologies to motivate more students.* *I consider it necessary because society is changing so fast that the teaching methodologies as well need to be adapted.*
Challenges		
Lack of confidence/Lack of preparation and knowledge	12.5%	*However, I have not had the opportunity yet to teach English so I do not know many apps or Websites that can help me and I have never had the chance to take a course about this.* *I think it must be included but I do not feel comfortable when I think I will have to include it because I know very few useful Websites and because I do not know how to include technology in the classroom. I am not sure that if I include technology students will be able to learn, because sometimes I think they will just play but will not remember the content (in the case of the games).* *I feel quite unsure about integrating technology into the classroom because I feel quite unsure about my knowledge of pedagogy/methodology to assess what may be useful.*
Lack of funding, lack of time, increased dependence on technology	2.5%	*There are some drawbacks such as the time that it has to be spent selecting the materials and topics but it is absolutely worth it.* *I feel like a lot of teachers lack the technological skills to successfully integrate technology into English teaching. I also believe there is a problem with lack of funding for some schools that could do with better, more up to date equipment.* *I think that it is a great opportunity because it takes teaching beyond the classroom and the teacher and it makes it easier for students to engage. However, I do think that we should be ready to teach without them, we cannot rely exclusively on them. They are a tool not a goal.*
Preferences - 16.6%		
Specific use of technologies for	8.3%	*I feel it is very important mainly for listening. Through videos / audios, students can get familiar with the different accents for instance. To learn vocabulary, Websites like*

language teaching	*Kahoot can be useful to teach it in a more interactive way, as well as to revise. In order for students to get familiar with the cultural aspect of a language, internet provides a wide range of good sources to visit, most of them constantly updated, unlike books. From my point of view, integrating technology into language teaching is essential. We need to forget about the CD player and use real videos/podcasts/interviews to teach students skills such as listening and reading. Moreover, PowerPoint is not always the best choice. You can make much nicer presentations with tools such as Prezi or Canva. Finally, creating debates for students in tools such as Padlet is useful and help to engage the students.*

5. Discussion

The study was carried out to help better understand the preservice EFL teachers regarding initial training in technology in Spain. Due to the increasing importance of technology in educational settings, its relevance in current education can hardly be overestimated (Espejo Villar et al., 2022). As stated by many researchers, the immersion of digital culture in education is one of the main pillars of teaching innovation (Monteiro & Leite, 2021; Morris & Rohs, 2023; Pangrazi & Sefton-Green, 2021). Several researchers so far have focused their attention on digital competencies in higher education (Fernández-Muñoz et al., 2020; Palacios-Hidalgo et al., 2022). However, research is still scarce in the area of EFL teaching (Open Learning, in press). Therefore, analyzing our students' perceptions about their TPACK skills and significant challenges and preferences offers essential information that could contribute to designing a predetermined syllabus to be implemented in preservice EFL teacher programs in Spain based on international technology standards.

The results reveal that our preservice teachers' perception of their command of technological content skills is relatively high. Students feel confident in identifying suitable topics to be taught with technology and representing the content using appropriate technology. In this sense, the results corroborate the findings of some previous studies conducted in the Spanish settings to assess the digital competence of EFL and bilingual education teachers (Palacios-Hidalgo et al., 2022; Palacios-Hidalgo & Huertas-Abril, 2021). Likewise, the overwhelming majority of the students believed in the potential of ICT for teaching and learning English (as seen in Table 4), which goes in line with some previous studies that show how technology can enhance language learning (e.g., Kang, 2019; Rodríguez et al., 2017). Some of the significant benefits highlighted by the respondents include the potential of technology for the EFL classroom as part of a new teaching method providing a wide range of opportunities (37,5%), a great way to engage students in the teaching-learning process (41,7%), as well as a reflection of the digitalization of the modern society (29,2%).

However, it seems that more support is necessary to develop pedagogical skills and pedagogical content skills, with some of these subskills perceived as insufficient. In particular, the most troublesome areas comprise those dealing with identifying appropriate strategies for the infusion of technology in the classroom to improve learner-centered teaching (45.8%), enhancing teaching strategies that are difficult to implement with traditional methodologies (37.5%), and teaching lessons combining content, technologies and teaching approaches (23.1%), among others.

Regarding the preservice teachers' perceptions of TPCK education received and the level of expertise achieved, the results surprisingly showed that a good number of the students recognized having received specific training in TPCK skills (84%) and even being ready to lead this kind of training for others (76.9%). These outcomes are surprising as no courses of this kind are offered in the master's program. Besides, the results contradict some recent studies that express concerns regarding the technology-based preparation of preservice teachers at various universities (Chaaban & Ellili-Cherif, 2017; Gudmundsdottir & Hatlevik, 2018; Tondeur et al., 2012). Furthermore, several studies with in-service teachers confirm that a lack of training and exposure to technology is the most frequent barrier to technology integration (Hsu, 2016; Kopcha, 2012). Further research is required to establish how our students receive training and determine the actual necessity for that training within the official curriculum.

Finally, our students' main challenges were mainly related to the 'not-having' items. In particular, not having time to integrate technology (54.2%) and learn new things (45.8%), together with a lack of technical and administrative support (45.8%). Consistent with previous studies, the lack of time to plan teaching and learning experiences that integrate technology remains among the highest barriers (Francom, 2019; Kopcha, 2012). Technology integration is unlikely to occur if a teacher does not have enough time to test a new technological tool or resource and plan transformative ways to use it (Francom, 2019; Tondeur et al., 2017). Additionally, technical and administrative support is crucial for efficiently

implementing technology in the classroom. Having the most significant effect on technology integration in the classroom (Gufidan & Koc, 2016), other studies reveal that the level of technical and administrative support in education is insufficient (Stansbury, 2008).

Interestingly, 'not knowing' challenges were not included among the top five barriers in the present study. Relatively, few respondents (from 12 to 20%) considered 'not-knowing' items as natural barriers, with the only exception of 'not knowing how to find suitable teaching texts and materials online' (37.5%). These findings contradict some previous research (Francom, 2019; Hsu, 2016) that describes 'not knowing' barriers as one of the most critical factors for effective technology integration. One possible explanation may be that our preservice teachers had a high level of general technological skills and were used to acquiring specific technological skills through self-tuition methods. Therefore, they did not consider perceive 'not-knowing' factors as a significant challenge. Further research is necessary to confirm this assumption.

Regarding our preservice teachers' technological preferences, the respondents showed a high level of recognition when dealing with some general teaching applications (Prezi, Kahoot, and Slideshare) and some specific EFL teaching Websites (ted.com, bbc.co.uk, or soundcloud.com). However, about 30% of general teaching applications and 40% of the specific EFL teaching applications were not recognized. These findings shed additional light on the question of 'not-knowing' challenges, explaining the difficulties respondents face when finding suitable teaching texts and materials and acknowledging the need for additional guidance and training on pedagogical content skills.

6. Conclusion

The current study sought to investigate the preservice English teachers' perceptions regarding the integration of technology in their future classrooms. The findings provide valuable insights into the state of the preservice EFL teacher training in Spain, with a specific focus on technology integration. It is clear that technology's role in education is indispensable, and the majority of the preservice teachers recognize its potential in enhancing language learning and promoting student engagement. However, the study also underscores the need for more support in developing technological pedagogical skills among future English teachers.

Pedagogical implications for prospective English teachers' initial teacher training in technology can be drawn from the results. These implications provide a valuable foundation to shape effective technology integration strategies in English language teaching. Firstly, the study suggests that most preservice teachers perceive their level of technological content skills as high. Nevertheless, there is a need for further training in pedagogical skills and pedagogical content skills. This need is particularly pronounced in areas related to identifying suitable strategies for infusing technology into the classroom, enhancing teaching methods that may be challenging to implement using traditional approaches, and creating lessons that seamlessly blend content, technologies, and teaching methodologies, among others. Secondly, the study reveals that 'not knowing' skills are not considered a significant barrier to technology integration by prospective teachers. Most of the respondents were willing to incorporate technology into the language classroom. Thirdly, a general lack of knowledge was observed concerning specific EFL teaching tools and applications to support teaching and learning activities.

In conclusion, it is essential to acknowledge that the findings should be interpreted with an awareness of a few limitations. Firstly, the study was based on the perceptions and self-reported skills, challenges, and preferences of 24 preservice English teachers regarding the inclusion of technologies in their future classrooms. These perceptions and self-reports may be subjective and not entirely accurate. Conducting interviews and observations in actual classrooms could enhance the study and help verify the alignment between the teachers' perceptions and their actual practices. Furthermore, the limited sample size makes our results preliminary. Nevertheless, these results shed light on areas that future research may explore. Some issues discussed in the findings, such as the need for training in pedagogical skills and pedagogical content skills, are significant implications to be considered.

In terms of future lines of research, further studies are necessary to explore teaching strategies that are more likely to enhance the acquisition of technological pedagogical skills and technological pedagogical content skills among the preservice teachers. Another area deserving of research could be related to the ways future teachers receive their training in TPACK skills. Finally, the examination of the role of government policies and educational institutions in shaping standardized technological education for EFL teachers is another issue that demands future attention.

Conflict of Interest

The authors declare that there is no conflict of interest.

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