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Let's Get Digital: ICT Training Needs in Pre-Service Language Teaching

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Abstract: During the last five years, language teaching in Europe has been heavily influenced by two major occurrences. On the one hand, the outbreak of COVID-19 forced teachers to extensively adapt many of their teaching practices to the digital world; this major paradigm shift is likely to have continued repercussions post-pandemic in terms of methodology and use of resources. At the same time, the publication of an updated version of the Common European Framework, commonly known as the Companion Volume focuses our attention on the real-life communicative needs of language users. The Companion Volume emphasizes digital and online communication processes throughout the development of language skills, and this focus inevitably translates into changes in national and regional curricula for language education. The present study investigates the degree to which future teachers are prepared for this new reality and explores emerging digital training needs among pre-service teachers. The investigation obtains quantitative and qualitative data from 30 pre-service teachers who have completed postgraduate studies in language education, which included a stage of school-based teaching practice. Results indicate that while pre-service language teachers have a positive view of ICT and moderate levels of general digital competence, they feel additional specific and in-depth preparation is required within their initial training.

Keywords: ICT; pre-service teacher training; foreign languages; CEFR Companion Volume; digital resources

1. Introduction

Training in the use of information and communication technology (ICT) for pre- and in-service teachers has become a priority in education as the availability of ever-increasing digital resources opens both a multitude of possibilities and a wide range of challenges. These opportunities and difficulties came to the fore with the advent of COVID-19 and the widespread use of online and blended learning activities. This period proved to be a challenging time for students and educators alike.

Nevertheless, several studies [1,2] point to positive outcomes when pre-service teachers are obliged to perform in more intensely digital environments. Other research, however, highlights the need for specific training, access to meaningful content, and online materials for learners [3].

In the case of ICT use in foreign language (L2) learning, we need to consider both general educational and specific language-related factors that are context-sensitive. In this sense, this present study aims to examine the degree to which pre-service teachers of languages receive sufficient training in the use of digital resources in the specific context of secondary education in Andalusia, in Southern Spain. Additionally, we wish to know how frequently pre-service teachers employ computer-assisted language learning within their school-based teaching practices (SBTP).

This study comes at a particularly important crossroads. Apart from the previously mentioned increase in the use of ICTs since the onset of COVID-19, language teachers are

now faced with new standards arising from the publication of the Common European Framework Companion Volume [4] (henceforth Companion Volume). Here, instructors are encouraged to move away from the old paradigm of listening, speaking, reading, and writing and are invited to see language learning from a more integrated pluricultural and plurilinguistic perspective, which holds at its core those skills related to reception, production, interaction, and mediation. Indeed, while pre-service and, for that matter, in-service teachers may readily understand, assimilate, and apply some of these key areas to teaching and learning processes inside and outside the classroom, others may not be treated so frequently. This new reality, then, would require an examination to see strengths and potential shortcomings in the training of future educators.

To ascertain the requirements of present and future pre-service teachers in this discipline, we first need to examine the demands outlined by the national curricular guidelines as well as the fundamental changes that have arisen with the advent of Companion Volume. Additionally, it would be useful to identify and assess the potential benefits and challenges involved in the implementation of ICT not only for pre-service L2 teachers but also for in-service teaching staff, in general, to help future professionals become more aware of the opportunities and possible pitfalls when engaging in computer-based teaching and learning processes.

While a review of the literature may help determine a number of these issues, it is equally necessary to gain insights from postgraduate students working within teacher training programs. This information may not only prove valuable for the specific context within which this study takes place but may also provide interesting insights for other similar educational settings.

2. Theoretical Background

In this section, we briefly examine some of the major concerns within training in digital resources for language instructors. This examination, which deals with both the potential benefits and challenges of the use of digital resources, is framed within the context of the new demands highlighted by the previously mentioned Companion Volume.

2.1. The Companion Volume and Current Legislative Guidelines in Spain

To see precisely what types of digital resources future teachers might need for language instruction, it would be necessary to briefly discuss the main contents of European guidelines and curricular demands in this context. In the first case, the required language skills and strategies outlined in the Companion Volume [4] along with current curricular guidelines (in this case in Spain) can help pre- and in-service teachers develop more tailored activities for the language class.

Built on the original Common European Framework published in 2001, the Companion Volume modernizes several parameters of language instruction and assessment. On the one hand, this update essentially reforms the old paradigm of communicative language skills (listening, speaking, reading, and writing) to focus on the four areas of reception, production, interaction, and mediation, while also focusing on the use of language (grammar, vocabulary, and pronunciation) and pluricultural competence.

It is within these first four areas (reception, production, interaction, and mediation) that we also see a concern for the incorporation of new technologies. The Companion Volume mentions the term 'online' a total of 102 times concerning all skills; the document also explicitly incorporates ICT within the major block of 'interaction' in the subset of skills of written and online interaction. Thus, this reference document provides scales and examples of activities that include aspects such as the understanding and creation of online reviews, contributing to social discussion networks, or ordering goods [4] (pp. 191–197).

These developments are echoed in national education guidelines for language teaching and learning. In the case of guidelines for secondary education in Spain [5], for example, we can see this concern reflected in several specific competencies:

- Receptive skills: understanding of oral, written, and multimodal texts using different support formats;
- Productive skills: expressing oral and written texts using different support resources.
- Interactive skills: participating in interactive activities using different resources;
- Mediation skills: mediating communication using physical and digital resources;
- Use of language skills: developing knowledge and strategies with the help of analogical and digital resources;
- Cultural knowledge.

Both at European and national levels, then, we can see how language communication skills and assessment criteria increasingly replicate real-world forms of communication, and this has an impact on teacher training. As it stands, in Spain, like many other EU countries, teacher training for primary education consists of a standalone degree in education, which often consists of two semesters of school-based teaching practice. For secondary school training, pre-service teachers generally specialize first with a degree (e.g., English philology or translation for English teachers) before completing a master's degree in secondary education, which, in the context of this study, also consists of a 100 h SBTP. In both cases, it is to be expected that teachers should have sufficient methodological training not only in the more general areas of communicative language teaching but also in the specific skills and knowledge that will enable them to encourage the development of these skills in their future students within increasingly digital contexts.

2.2. The Importance of ICT in Language Education

Over the last two decades, there have been an increasing number of studies in the field of language teaching and learning that point to the usefulness of ICT in developing a wide range of communicative skills. For this paper, it may be useful to briefly examine results obtained through larger cohorts, as seen in recent systematic reviews and meta-analyses.

Beginning with reception, for example, a study of 20 experimental investigations found that EFL learners using mobile-assisted language learning benefitted more than those using traditional methods concerning listening skills [6]. Other practices in the language class, such as flipped learning, show advantages for learners, as can be observed in Vitta and Al-Hoorie [7], in which technology played a prevalent role. Similarly, in Ying, Zilong, and Liu's [8] study, augmented reality is seen to have a large effect on learner performance and motivation. Additionally, in Huang, Hew, and Fryer's [9] meta-analysis identifying 25 empirical studies, educational chatbots were useful in that they provided learning support and interpersonal communication.

These studies also show, however, that ICT is not free from limitations. Issues such as technological limitations and increased cognitive load are detected by Huang et al. [9] Additionally, technology-based learning is not a panacea to remedy all language learning shortcomings. Huang's [10] examination of education systems in 13 countries, for example, found that in two cases, ICT use for English learning correlated negatively with written performance.

In general terms, a major factor in the successful use of ICT lies in teacher familiarity with available technologies [11]. Yet while studies do exist to determine the capacities of pre-service teachers to engage with such technologies in their future teaching career at general education levels (discussed below), an examination of academic databases for education shows a paucity of recent work that describes trainee teacher competence in the totality of the specific components (including mediation) contained in the CEFR Companion Volume.

2.3. Overview of ICT in Pre-Service (Language) Teaching

The benefits of ICT training at a general population level would seem to be one of the prime drivers of economic growth. In their review of high-, medium-, and low-income countries (total countries = 123), Appiah-Otoo and Song [12] conclude that information and communication technologies are indeed linked to the economy and recommend the promotion of education in this area. Similar conclusions are drawn in the European Com-

mission's [13] 2030 Digital Compass, which in addition mentions the potential benefits of the use of digital technologies in the development of more sustainable forms of energy, business efficiency, and the improvement of participation in democratic life, among other aspects.

These findings have led the Commission to encourage the development of highly skilled and digitally empowered professionals. Naturally, then, in recent years, the integration of information and communication technologies has become increasingly prevalent in various educational contexts, including that of pre-service language teaching. The incorporation of digital training at this stage aims to equip aspiring language educators with the necessary skills and innovative teaching approaches to enhance language learning experiences for their future students [14].

ICT offers a wide range of tools that can transform language teaching and learning processes. One of the primary benefits of incorporating digital and online resources in pre-service language teaching lies in the exposure of aspiring teachers to diverse learning platforms and teaching methodologies; it allows them to explore and experiment with various digital tools, such as multimedia materials, language learning apps, virtual reality, and games. Other benefits include the encouragement of active learning and critical thinking, the promotion of skills beyond mere content learning, as well as potential benefits for the education institutions themselves and more attractive learning platforms [15]. Ultimately, then, ICT can help learners to think, communicate, and perform better in a world that is increasingly digital [16], and by facilitating the pre-service language teachers' familiarization with these technologies, they can better understand the potential of such tools in fostering language acquisition and promoting student engagement in the classroom [17]. However, for this to occur, specific training in computer-assisted language learning (CALL) technologies and applications would be necessary (see [18]).

In terms of training development for specific language teaching competencies, several studies provide useful insights. One such example may be seen in terms of language reception, production, and mediation in Hautemo and van der Merwe's [19] study involving 24 student teachers who employed Wikipedia for collaborative translation activities; findings in this study indicated that the use of the platform facilitated the acquisition of new communication skills. Development and knowledge of linguistic competence tools have also been the focus of teacher professional development. Koltovskaia's [20] investigation on in-service and pre-service teachers' use of Grammarly as a complement to teacher feedback found that this type of application, while it had limitations and still required teacher input, did provide useful feedback and helped identify the most frequent errors. Rets, Rienties, and Lewis [21] conducted a six week study on the use of virtual exchanges for intercultural effectiveness (IE) between pre-service teachers from Portugal and Brazil and found that the experience provided IE gains for 70% of participants.

In addition to these specific areas, the integration of higher levels of digital training in pre-service language teaching can encourage and enhance collaborative learning experiences. Aspiring teachers can connect with peers and instructors through virtual communication platforms, enabling them to engage in discussions, share teaching ideas, and collaborate on projects [22]. Such interactions help to develop their technological competence and prepare them to effectively manage digital classrooms in the future.

Another crucial aspect of using ICT in pre-service language teaching is its role in fostering teachers' digital literacy. As technology continues to evolve rapidly, language educators need to stay up-to-date with the latest digital advancements and adapt their teaching practices accordingly [23]. Pre-service language teachers can be exposed to ongoing professional development opportunities related to ICT integration, enabling them to keep abreast of emerging trends and pedagogical approaches in technology-enhanced language teaching.

Furthermore, digital training in pre-service language teaching can improve the understanding of culturally responsive teaching strategies. Future language educators can utilize digital resources to introduce students to diverse cultures and linguistic practices,

promoting intercultural competence and awareness. These pre-service teachers can also explore authentic materials from various cultures, use online language exchanges to connect with native speakers, and incorporate virtual cultural simulations into their teaching practices [24].

However, despite these potential benefits, challenges may arise during the implementation of ICT in pre-service language teaching. Pozas and Letzel [25] examined the perspectives of 103 pre-service teachers, and while participants perceived their digital competence in a positive light, the authors note that this perception does not necessarily translate into efficacy in teaching and learning situations.

Limited access to technology, a lack of digital literacy among pre-service teachers, and the varying availability of infrastructure in educational institutions can hinder successful integration [26]. This view is echoed in a review of the literature on obstacles preventing ICT use among pre-service teachers, where Mirzajani et al. [27] mention limiting factors such as a lack of training, knowledge, and skills along with the unavailability of hardware, software, or time; they also highlight the need for leadership support. This situation may worsen when dealing with the specific area of virtual reality (VR), as we can see in Coban et al.'s [28] study in the field of STEM education. Here, participants expressed that VR could potentially have a positive impact; however, they also stated that they lacked experience in using this type of technology. Similarly, in Jong's [29] investigation into the use of immersive VR among pre-service teachers, participants, while acknowledging potential benefits for their teaching, also highlighted problems in terms of convenience, user-friendliness, and familiarity with the technology. Additionally, we can also find contexts in which the use of ICT is at medium-low levels and where Web 2.0 tools are not employed [22].

In Hughes and Tulimirovic's [30] investigation into the perceived usefulness and actual use of computer-assisted language learning in an adult language training context, we found that while learners may have seen certain technology-based activities as being beneficial, this did not necessarily translate into increased use. At the same time, significant differences were found between the use of digital resources in male and female participants, whereby the latter group employed ICT more frequently for activities based on oral expression, oral interaction, written reception, and grammatical competence. Furthermore, we detected a mismatch between teachers and learners in terms of stated activities completed. From this information, we could argue that it is crucial for teacher training programs to address these challenges and offer support in overcoming them.

Indeed, training and competency in digital resources would appear to be an essential component of pre-service training. Lorenz et al.'s [31] study provides evidence to indicate that teachers' perceived technological pedagogical content knowledge may be the most important predictor of the actual use of ICT and, indeed, of their computational thinking. Similarly, Pozas and Letzel [25] find that attitudes and perceived competency are strong predictors of future use.

ICT training in pre-service language teaching, then, holds significant promise in preparing aspiring language educators for the digital age; at the same time, however, there are several challenges. By integrating digital resources into teaching programs, future educators can develop digital literacy, explore innovative teaching methodologies, and foster intercultural awareness. To maximize the potential of ICT in pre-service language teaching, however, educational institutions and teacher training programs must remain committed to providing comprehensive and up-to-date training, ensuring that future language teachers are well equipped to leverage technology effectively in their classrooms.

2.4. Specific ICT Needs for Pre-Service Teachers

To see the main digital training needs of pre-service teachers, including the use of multi-user virtual environments, it might be useful to discuss major activity types that may eventually be completed by learners in class. Here, an initial insight into the type of training needs of pre-service language teachers can be initially glossed over from

Mantzious et al.'s [32] review, which enumerates a series of learning affordances (i.e., learning opportunities leading to learning outcomes) within several disciplines, including language education. Among these affordances, we find [32] (pp. 1740–1741):

- Free navigation (e.g., arising from first-person experiences such as virtual field trips);
- Creation (e.g., arising from real-time interaction and involving building or creating);
- Modeling and simulation (which can involve simulation and imitation);
- Multichannel communication (e.g., discussions, the use of avatars for interaction);
- Collaboration and cooperation (e.g., in meetings or roleplays);
- Content presentation and/or delivery (e.g., using shared interactive whiteboards or giving presentations).

From these categories, we can begin to see some of the principal areas of activity that could essentially take place within any general education ICT-based learning environment. In specific terms of language education, activities completed by learners in Mantzious et al.'s review included role-playing games, virtual tours, presentations of topics, collaboration between native and foreign speakers, and scavenger hunts. Teachers also engaged in the development of activities, such as the design of virtual spaces (e.g., the supermarket), whereby learners could practice, as well as the creation of communication activities with bots.

Building on concepts presented by the above-mentioned authors and using a synthesis of qualitative evidence (SQD) strategies, Jeon et al. [33] implemented a series of measures during a 16 week intervention program to help pre-service teachers notice and utilize affordances within a virtual environment platform. Among the conclusions, these researchers advocate both top-down processes from instructors (e.g., guidance, modeling, and feedback) and bottom-up strategies from pre-service language teachers (e.g., collaboration in technology use and design for learning situations).

3. Methodology

To explore pre-service digital training needs and the frequency of use of digital tools for specific language skills, we have designed instruments and collected data from a sample group who undertook a master's degree in secondary education. The following section details the design, participants, instruments, and data collection processes involved.

3.1. Research Design

The phenomenon under study in this investigation is complex and multidimensional, and, thus, a mixed-methods approach has been considered beneficial for the attainment of the defined objectives by overcoming the limitations of solely relying on quantitative or qualitative research. This approach enables a complementary analysis that capitalizes on the strengths of each data type, leading to a more comprehensive understanding of the study [34]. This mixed-methods study focuses on examining student teachers' perceptions of the implementation of ICT in the English language classroom. The main research questions in this study are as follows:

RQ1. What perception do pre-service teachers of languages have of their abilities to use ICT for language education?;

RQ2. How frequently do pre-service teachers employ ICT in terms of key language learning skills (reception, production, interaction, mediation, use of language, and pluricultural aspects)?

3.2. Participants

This study collected data from pre-service English language teachers participating in a master's degree in secondary education in Andalusia. Invitations to participate in the survey were sent to a total of 100 master's students who belonged to three different groups, of which a total of 30 responded. All three groups had completed course modules, which included general education, language-specific teaching and learning components, and 100 h of school-based teaching practice. Before participating in the study, respondents

received information on the nature of the survey, indicated that they had understood the information provided, and gave their consent to have their answers recorded anonymously.

A total of 5 male (16.7%) and 25 female (83.3%) students agreed to participate in the investigation. The age of the students ranged from 22 to 45; the majority (82.8%) were 30 years of age or younger. In terms of undergraduate degree courses undertaken before embarking on the master's course, 15 had completed English philology, 13 had completed a degree in translation and interpreting, one had completed a double degree in primary education and English studies, and one in foreign languages.

3.3. Instruments

To gather data to answer the research questions, a questionnaire was designed using adapted elements of a previously published study [30], and additional questions were devised and revised by three researchers. These questions aimed to determine participants' competence in terms of the use of ICT in the language class and to ascertain the frequency with which they used said ICT for specific language skills (reception, production, interaction, mediation, use of language, and pluricultural aspects), which are the central components of the Companion Volume and national and regional curricular guidelines in Spain. An internal consistency test (Cronbach alpha) of the quantitative questions was later conducted on responses provided by participants.

The final instrument consisted of the following sections:

- Informed consent;
- Biodata;
- Statements on general aspects of the use of ICT during the master's using a Likert scale from 1 (totally disagree) to 5 (totally agree);
- Statements on their use of ICT during school-based teaching practice in key areas of language teaching and learning based on the Common European Framework Companion Volume [4] and recently introduced legislation for language teaching in Spain [5]; these statements employed a five-point frequency scale from 1 (never) to 5 (always);
- Three open-ended questions discussing (a) types of digital resources and applications employed; (b) resources that were lacking in L2 education; and (c) recommendations for the future treatment of ICT in pre-service training programs.

The data of the participants have been treated with the highest level of confidentiality and scientific rigor. Their usage has been reserved solely for research purposes, adhering to the scientific methods required in each specific case and complying with the regulations on the protection of personal data [35]. Additionally, the study was certified by the ethics committee at the University of Granada.

3.4. Procedures

As previously discussed, master's students received an invitation to participate in this study and responded online using the Google Forms platform. The collected data were transferred to two different platforms: (a) SPSS Version 28: biodata and closed questionnaire responses; (b) NVivo Version 12: open-ended questions.

With this data collected, we performed the following measures:

1. Calculation of Cronbach alpha for internal consistency in closed questions;
2. Calculation of mean scores and standard deviation in closed questions;
3. Thematic analysis for open-ended questions.

This study employed thematic analysis as the chosen qualitative method. Thematic analysis is a suitable method to reveal common or shared meanings, allowing for a profound understanding of experiences, thoughts, or behaviors [36]. The analysis employed an inductive approach that draws from the narratives of the students. These narratives of the student teachers constituted the primary data source. The researchers were responsible for analyzing these narratives (data) to draw conclusions (explanations and interpretations).

To accomplish this, a cyclical process was carried out consisting of six fundamental stages: familiarization, coding, theme search, theme review, theme definition and naming, data interpretation, and conclusion [37]. Thus, a thorough familiarization with the data was necessary, involving multiple readings of the narratives, a process akin to holistic content reading. During this phase, the main themes emerging from the student teachers' narratives were identified, corresponding to different categories and subcategories. This process involved identifying emerging topics in the text by breaking them down into relatively small content units, which were then subjected to descriptive treatment [38].

Once this stage was completed, the data was categorized and coded using NVivo qualitative analysis software, aimed at revealing trends and patterns. This process allowed us to gauge the frequency of appearance of these themes, essentially quantifying how often the students referred to different themes (categories and subcategories) in their narratives [39]. The transformed qualitative data underwent a review by three experts, who focused on assessing the credibility, transferability, and confirmability of the data, ensuring the trustworthiness and validity of the study. The final stage involved interpreting the data to formulate conclusions. This thematic analysis is aimed at uncovering student teachers' perceptions of the implementation of ICT in the English language classroom, enhancing the comprehensibility of the quantitative results.

4. Results

In this section, we provide data obtained from responses provided for the open and closed questions of the survey. Before examining the quantitative data in more detail, it is necessary to discuss the reliability of the scales in the closed questions. Similarly, before discussing the hierarchy of themes obtained from open-ended responses, we present the major themes and subthemes that emerged.

Concerning the closed questions, we used Cronbach alpha to test the internal consistency of the two groups of statements on (a) general aspects of the use of ICT (six items) and (b) the use of ICT during school-based teaching practice (sixteen items). The results of this test were $a = 0.76$ for the first group and $a = 0.83$ for the second, which shows acceptable levels of internal consistency in both parts.

In terms of the open-ended questions, Table 1 presents the definitive themes and subthemes achieved through a six-phase process that involved familiarization, coding, theme search, theme review, theme definition and naming, data interpretation, and conclusion.

Table 1. Definitive themes and subthemes.

Themes	Codes	Subthemes	Codes
Student teachers' knowledge regarding types of digital resources	DR	Digital resources for classroom management Digital resources for language teaching	DRC DRL
Student teachers' perceptions of lacking digital resources in L2 education	LR	Productive skills Receptive skills Mediation Interaction Pronunciation Culture Other abilities	LRP LRR LRM LRI LRN LRC LRA
Student teachers' recommendations for the future treatment of ICT in pre-service training programs	RT	Training during the master's Training during the degree Successful and unsuccessful examples ICT practical implementation	RTM RTD RTE RTI

4.1. Descriptive Results for General Aspects of ICT Training and Use

This section provides data referring to the initial training received on ICT and general levels of knowledge, appraisal, and usage of this type of tool during initial teacher training. Table 2 indicates the mean scores and standard deviation in these areas.

Table 2. General aspects of ICT training.

Aspects	N	Min.	Max.	Mean	S.D.
I received initial ICT training before entering school-based teaching practice	30	1	5	2.83	1.44
ICT is a fundamental part of my teaching practice	30	2	5	4.03	1.07
I am knowledgeable of reliable sources and can teach my students how to use them to look for information outside of school	30	1	5	3.83	1.02
I use ICT to work on basic knowledge in an interdisciplinary way	30	2	5	4.03	0.81
ICT allows me to be in closer contact with my students	30	2	5	4.43	0.86
I consider that ICT has contributed considerably to the improvement in academic performance	30	3	5	4.23	0.82

From the above table, perhaps the most striking finding is the relatively low score related to training received in ICT before entering real school contexts (mean = 2.83). In this item, we can observe that there is a higher score in the standard deviation, which could indicate discrepancies in opinion, possibly arising from the fact that students came from different groups with different teacher training instructors. Higher levels of agreement appear in the use of ICT (4.03), their potential to improve teacher–student contact (4.43), and their possible contribution to academic improvement (4.23). These results could suggest that despite lower scores in actual training, there is, initially at least, a high degree of both use of and appreciation for technology-based resources in language education.

4.2. Descriptive Results for Key Areas in Language Education

In terms of the use of digital resources for specific language skills, we examined the frequency of use during the school-based teaching practice phase. The results obtained concerning this SBTP phase are shown in Table 3.

Table 3. Frequency of use of ICT during teaching practice.

Skill	N	Min.	Max.	Mean	S.D.
Oral comprehension	30	2	5	4.03	0.85
Audio–visual comprehension	30	3	5	4.17	0.79
Written comprehension	30	1	5	3.03	1.07
Oral production	30	1	5	3.73	1.11
Written production	30	2	5	3.47	0.97
Oral interaction	30	1	5	2.30	1.09
Written interaction	30	1	5	2.33	1.03
Mediation of texts	30	1	5	3.07	1.08
Mediation of concepts	29	1	5	3.10	1.05
Mediation of communication	29	1	5	2.86	1.03
Lexical range and control	30	1	5	3.70	0.92
Grammatical control	30	2	5	3.47	0.82
Pronunciation	30	1	5	3.00	1.20
Orthographic control	30	1	5	2.77	1.07
Pluricultural repertoire	30	1	5	3.20	1.16
Plurilingual comprehension	30	1	5	3.23	1.073
Valid N (listwise)	28				

As can be observed, two activities (oral and audio–visual comprehension) received high-frequency scores, while the remainder failed to cross the threshold of four points. Particularly low scores were assigned to oral and written interaction, which may suggest a lack of training, a lack of availability of such resources, or a combination of both. Relatively lower scores were also assigned to the recently introduced language skill of mediation.

4.3. Qualitative Results

This section presents an overview of student teachers' appraisals of the use of ICT in pre-service language teaching. For presenting these results, the main themes raised in the inductive thematic analysis are outlined. Here, Figure 1 is a hierarchical map of the resulting coding of the student teachers' opinions; the size of each subtheme represents its presence in the interviews.
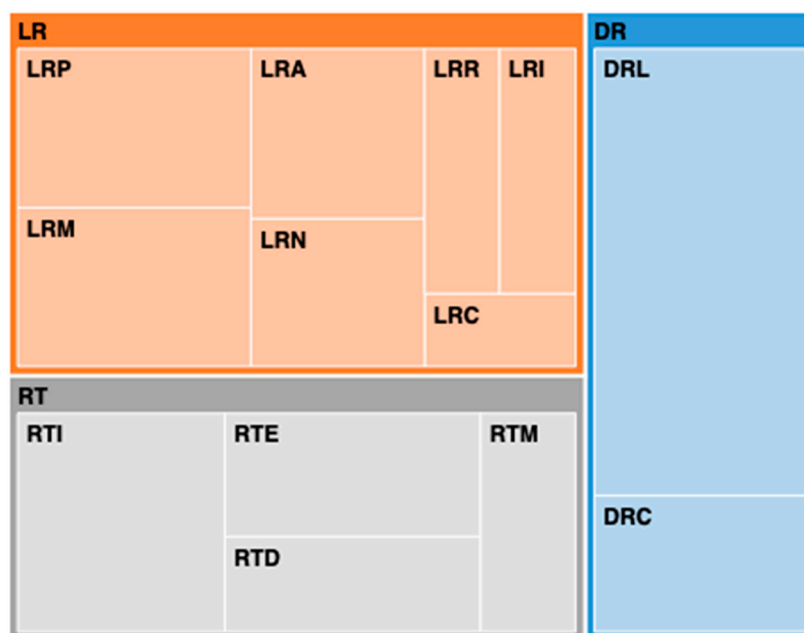
Figure 1. Hierarchical map including the three themes and subthemes studied.

Theme 1 refers to student teachers' knowledge regarding types of digital resources (DR). This theme addresses their familiarity with different types of digital resources. Based on their responses, participants seemed to place digital resources into two groups: those related to classroom management (DRC) and those utilized for language teaching purposes (DRL). The latter subtheme recorded the highest number of references, with a total of 26 mentions; this indicates that the student teachers cited various digital resources associated with language teaching on many occasions. In contrast, teachers only made eight references to digital resources related to classroom management.

Most of the student teachers claimed to possess knowledge about a diverse range of digital resources (including Web 2.0 or participatory webs) that can be effectively utilized in language classrooms. Here are testimonies from three different students:

A17W—[Factile, Baamboozle, Mentimeter, Padlet, Canva, YouTube, BBC, British Council, Flinga, Mindmeister, Flipgrid];

A22W—[Genially, Kahoot, Wordwall, Liveworksheets];

A28M—[Plickers, Soundtrap, Padlet, Memrise, Jeopardy, Song Trivia2, Teachflix].

Some of the student teachers mentioned that they were not familiar with any digital resources. This discrepancy in opinions might be attributed to the fact that the students came from different groups within the master's course. This result aligns with the previous responses provided in the closed questions of the questionnaire.

Regarding the digital resources used for classroom management, as previously mentioned, students referred to them on fewer occasions. The most frequently mentioned resources were as follows:

A15W—[Google Classroom, Google Sites, Classroomscreen, ClassDojo].

Theme 2 refers to student teachers' perceptions of the lack of digital resources for L2 education (LR). The students mentioned various key language skills (productive skills, receptive skills, mediation, and interaction) and other aspects of language such as pronunciation, culture, creativity, or autonomy (the latter among others included in the subtheme 'other abilities'). As indicated in the hierarchical map (Figure 1), the two subthemes with the highest number of references coded (LRP and LRM) were related to the lack of digital resources for teaching productive and receptive skills and mediation in L2 education, with a total of 10 references each. This limitation can be observed in the following testimonies:

A6W—[I consider that there is a scarcity of resources to practice speaking in a foreign language, which would be very interesting];

A16M—[Many more digital resources need to be taught to delve into aspects related to mediation];

A21M—[There is a shortage of well-adapted oral texts at different levels that are interesting for students].

If we compare this information with the data shown in Table 3, we can see a confirmation of a lack of resources for oral interaction. We also see perhaps a more pointed concern for resources for mediation than the quantitative data in Table 3 might initially suggest.

Participants also emphasize the significance of promoting good pronunciation in language learning; specifically, there have been seven references related to this subtheme. They express the need for more exposure to digital resources that facilitate practicing pronunciation:

A3M—[There should be more tools and activities to help students improve their pronunciation skills using technology. As an educator, I am not familiar with many resources or types of activities in this regard];

A29W—[Nowadays, technology enables us to listen to and work on pronunciation more easily, not only by listening to the teacher. Therefore, I believe that we need to make better use of new technologies to work on pronunciation in class and in a fun way].

As can be observed, the student teachers emphasized the need for a broader range of digital resources that cater to different language areas, such as speaking, meditation, and pronunciation. They suggested incorporating various interactive tools and language apps to enhance language learning experiences.

Theme 3 refers to student teachers' recommendations for the future treatment of ICT in pre-service training programs (RT). Based on their responses to the open-ended questions in the survey, they distinguished between recommendations for integrating ICT during their previous degree programs (English studies and translation and interpretation degrees) and their training in the teacher training master's program.

Their opinions regarding this topic were quite similar, with seven references to the need for the inclusion of ICT training in the degrees and six references pertaining to the master's program. The following testimonies demonstrate their need for ICT training either during their undergraduate degrees (RTD) or their master's training (RTM):

1.   Training during the degree (RTD)

A11W—[Increased training from the beginning of the degree; courses to learn how to use ICT in the classroom and specifically in foreign language teaching];

A4M—[Specific training should be addressed in the degree programs as it is much-needed training for future teachers];

A6W—[In English teaching classes at the university level, it would be very useful for us to be introduced to digital resources that facilitate language instruction. It is known that students nowadays prefer using new technologies over studying with a book].

2.   Training during the master's (RTM)

A13W—[It would be advisable to include in the master's curriculum a subject exclusively dedicated to training in ICT resources and their applications in the field of language teaching];

A30W—[It would be great to include in the master's program more time for explaining the basics of the ICT resources that we could implement in the language classroom. For example, through the inclusion of courses, seminars, or others];

A3M—[It would also be useful to have access to forums where the use of ICT, specifically certain ones, is discussed, as well as scientific articles that support their reliability].

As we can see, many student teachers emphasized the need for pedagogical training on how to effectively use ICT in language teaching. Participants recommended workshops, seminars, or courses that focus on best practices for incorporating digital resources into language lessons, ensuring that their usage aligns with language learning objectives.

Additionally, some student teachers did not specifically mention the training programs but rather focused on the methods of integrating this information. Some highlighted the

inclusion of both successful and unsuccessful examples in the training as a good practice, as can be observed in the following examples:

A3M—[It would be very useful to present (new) applications along with concrete examples of their use in the classroom and, if possible, the experiences of teachers who have used them and their advantages and disadvantages].

A10W—[Understanding the first-hand experiences of teachers who have successfully integrated these tools, including both the positive outcomes and challenges faced, will provide valuable insights as we embark on our teaching journey].

The student teachers expressed the desire for ongoing support and guidance from experienced educators or technology specialists during their pre-service training. Some participants mentioned that mentoring and assistance with the use of successful and unsuccessful experiences would boost their confidence in utilizing ICT effectively in language teaching. Respondents also recommended that pre-service training programs should equip them with the ability to adapt to new tools and technologies as they emerge in the future. Other participants preferred a more practical approach, suggesting the implementation and creation of different activities using ICT and emphasizing practical training over theoretical instruction. A total of 13 references were made. This can be seen in the following testimonies:

A8W—[We need practical application of ICT to explore these resources in greater depth];

A7M—[Being introduced to innovative applications, accompanied by practical examples of their implementation in teaching settings, would be immensely beneficial for us, especially considering our future roles as educators];

A17W—[Useful and straightforward websites that do not require much time to create activities, pros and cons of each one, real-life experiences of how they have worked in the classroom, potential issues that may arise regarding activity management, not an extensive array of resources but a small selection that is practical, and strategies for addressing diversity if needed].

The student teachers emphasized the importance of practical implementation of ICT tools during their pre-service training. They suggested that hands-on practice with various digital resources should be an integral part of the training program, enabling them to develop the skills required for effective integration in their future classrooms.

5. Discussion

The use of ICT for language learning has become an integral part of pre-service teaching courses and, as such, requires continued monitoring, particularly when European guidelines as well as national and regional legislation introduce important changes in the curriculum. This study set out to examine student teachers' perceptions of their abilities to employ ICT for the spectrum of activities required for their future classes as well as to ascertain their actual use of technology for specific language skills. The sample size does not allow for generalizability; however, it is possible that similar results could be present within teacher training courses working within analogous frameworks to the context described.

Concerning the first research question of this paper, which deals with initial teacher perceptions on the use of ICT for language education, we could begin by indicating that in general, there is a positive assessment of the benefits of ICT, which coincides with other research [8,11] and is important as studies [25] find that attitudes towards ICT are a predictor for future ICT use. ICT is also seen as a tool to facilitate teacher–student communication [9].

Scores for another predictor of success, which is competency in ICT use, are somewhat lower. Firstly, perceived levels of knowledgeability were neither particularly high nor low (score = 3.83), and there was some variability in terms of participants' familiarity with available resources as seen in open-ended question responses. The initial teacher training provided was also less optimal (score = 2.83), and this finding may be encountered in other contexts [24].

The responses in the present study, however, do show a comparatively higher level of working knowledge of multiple Web 2.0 tools. Indeed, pre-service teachers expressed

that they knew a wide variety of learning platforms. Nonetheless, they also indicated that there was a lack of resources for the development of skills [26]; as previously discussed, lack of training and resources are shown as obstacles to the use of ICT during initial teacher training [27].

In terms of the second research question and the frequency of use of ICT for key language learning areas, overall, there are indications of regular employment of tools in the language class. As expected, we can see some skills are more frequently employed than others. Comprehension (both oral and audio–visual) and production (oral and written) are among the most employed skills during teaching practice in schools; others, such as oral and written interaction, receive lower frequency scores, which coincides to a large degree with previous studies [30].

Of particular interest is the question of the mediation of texts, concepts, and communication. Scores in this area are not especially high or low (range = 2.86–3.10), and open-ended responses indicate a greater need for training; this would concur with other research [40], which indicates limitations in pre- and in-service teacher training in this area. It is also possible, however, that there is a need for an increase in the availability of digital resources that explicitly deal with this skill and are not limited to the area of text translation [19].

The use of language activity types (grammar, vocabulary, and pronunciation), while improvable, is more frequently employed than certain communication skills in this study, and this would again coincide with previous research [30]. The nature of this type of activity, combined with the availability of resources as opposed to more communication-based materials, may influence rates of usage and could require additional efforts to redress any communicative imbalances.

Finally, aspects related to pluricultural competence have a medium rating in this study, which may constitute another area of improvement and one that could be at least partially resolved through engagement in online intercultural experiences [21]. Again, these scores are generally lower than those ascribed to the use of language, and this would further reinforce the need to focus more closely on all the components of communicative competence as outlined in the CEFR Companion Volume [4] and legislative guidelines [5].

In general terms, then, we can see a certain level of concurrence with other studies concerning the perceived importance of ICT in language class, including areas of student performance and enhanced possibilities for teacher–learner communication. Additionally, the study concurs with the necessity for training, which ideally would cover the most important areas of (all) skill development and systematically include the entirety of participants in training programs.

6. Conclusions

From the results obtained, we can draw several tentative conclusions concerning the cohort of pre-service teachers who participated in this study. Firstly, from the diverse responses provided, we can infer that there is a high degree of willingness to learn about and use ICT for language teaching and learning. Additionally, in terms of training, we can see that there is a concern for a greater level of inclusion of ICT and digital-related content during their initial training period, particularly before they enter the more practical SBTP phases. These recommendations reflect an eagerness to embrace ICT in language education and a desire for comprehensive training that prepares teachers to be effective digital educators. This readiness to incorporate technology-based learning resources is seen as a necessary first step toward future ICT use.

We also observe that there is a high level of variability in terms of the frequency of use of ICT for specific skills. This variability may be due to a series of factors, including training (or lack thereof) or the availability of specific resources; it may also be the case that teachers give priority to certain activities over others, although this aspect goes beyond the scope of the present investigation.

In this area, there is a need to provide pre-service teachers with ample opportunities to discover, engage with, and employ a wide range of digital tools that cover the main skills discussed in the CEFR Companion Volume and national and regional curricular guidelines. Of note here is the desirability of training courses to provide greater insights into the treatment of interaction and mediation.

In the first case, oral and written interactive resources may depend more on factors such as the possibility of communicating with others outside school settings; in this sense, the creation of partnerships with other learning contexts could be seen as beneficial. In the second case, however, student teachers may need to gain a firmer grasp on the concept of mediation, which, by its very nature, is present in a wide variety of receptive, productive, and interactive skills.

Overall, the frequency of use of many skills within digital learning scenarios falls within low-to-medium levels in this study. This fact, combined with the relatively low level of training before the SBTP phase, would suggest that more could be performed to enhance pre-service digital training before teachers enter real school contexts. Specifically, one recommendation would be for the inclusion of task-based pre-service teacher activities within each of the different skills/competencies' components (receptive, productive, interactive, mediation, use of language, and culture), both in terms of discrete skills as well as integrated skills practice. These tasks could include areas that focus on a broad range of digital resources, including interactive tools and language applications that could improve pre-service teachers' confidence and teaching abilities.

By acting on recommendations provided by participants in this study, current pre-service training programs in the context of writing may better equip language teachers to leverage the potential of ICT more effectively in their classrooms. As mentioned, however, the sample size in this investigation allows us only to scratch the surface of the phenomenon of the use of digital resources in pre-service language education, and further research in this area could provide more beneficial insights. In this sense, it would be useful, at a general level, to develop new training resources and measure their effectiveness. It might also prove fruitful to examine other specific areas that are emerging in language teacher training, such as mediation, to see the degree to which these concepts are fully assimilated by teachers and incorporated into digital learning scenarios.

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