

Apps Integration in English Language Education: Shifting Perspectives of Pre-Service Teachers

Gloria Luque-Agulló*
University of Jaén, Spain
Encarnación Almazán-Ruiz
University of Jaén, Spain

Correspondence

Email: gluque@ujaen.es

Abstract

This work aims to find out pre-service English teachers' perceptions on how effective and intuitive a checklist (Luque-Agulló & Almazán-Ruiz, 2023) is for assessing the usability and educational value of language learning and teaching apps (Research Question 1), and to what extent participants' perceptions of the pedagogical value of apps have evolved after the COVID-19 lockdown (Research Question 2). To do so, the paper introduces a classroom study at the University of Jaén with two groups of pre-service teachers during two semesters in the academic years 2020/21, after the COVID lockdown, and 2022/23, when physical teaching took place. As part of a classroom project, participants had to use the checklist to evaluate apps to be potentially used in their future classroom practice and then analyse its clarity and usefulness by means of a questionnaire. Results show that pre-service teachers' perceptions about the checklist were positive, with higher values for the 2022 group (RQ₁). The comparison of both groups also reveals a shift in attitudes, as there is an increased tendency towards integration of apps in the classroom, and a higher predisposition for apps analysis (RQ₂). The article ends with the conclusions, which include the pedagogical implications and limitations of the study.

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¹Introduction

The proliferation and fast-changing nature of technologies in educational contexts in the last two decades, including EFL teaching, has led to a swift change in instructional

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paradigms, particularly during and after the COVID lockdown (Kukulska-Hulme, 2021; Reinhardt, 2022). Educational stakeholders have been forced to learn new ways to teach and learn using *new* technologies (ICTs), whether they like them or not, and despite their *digital* knowledge and experience in using ICTs (Chapelle & Sauro, 2017). Given the fast pace at which ICTs are evolving, every educator, including pre-service English teachers, needs to be able to reduce the digital competence (DC) gap and integrate technology in the classroom (Kukulska-Hulme, 2021) in a critical, safe, and pedagogically relevant way. Moreover, younger generation teachers, known as *digital natives*, are expected to adapt better to this new teaching paradigm than older generations or *digital immigrants*. Still, the myriad of technologies and applications available for pedagogical uses on the one hand, and the need to align content and technology in a pedagogically relevant way in the classroom, on the other (Upor, 2022), makes it necessary to raise trainee teachers' awareness of relevant criteria to select and evaluate apps for teaching and prepare them for their future practice in these technologically enhanced times.

This work introduces a classroom study with two groups of pre-service teachers, in the academic year 2020/21, after the experience of the COVID lockdown, and in 2022/23, with physical teaching. They had to use a checklist (Luque-Agulló & Almazán-Ruiz, 2023) to evaluate apps for language learning, later analysing its usefulness for their future classroom practice. The study attempted to find if there has been a shift in attitudes towards ICT pedagogical use during and after the COVID lockdown, on the one hand, and whether using apps and evaluating them by means of the rubric raised the awareness of prospective language teachers in developing criteria for inclusion/exclusion of ICTs in their classroom practice.

To do so, the notions of digital nativeness, literacy and competence are developed. Then, two main schemes are put forward: first, the European proposals that address the notion of digital competence (DC) for educational stakeholders (DigComp-DigCompOrg-DigCompEdu). Second, the TPACK framework, which approaches technological skills around a three-fold dimension: Pedagogical (PK), Content (CK) and Technical knowledge (TK). After that, the objectives of the study are put forward, followed by the research questions, a discussion of the main results/findings, and finally, the conclusions, pedagogical implications and limitations of the study.

Theoretical Background and Literature Review

Digital Nativeness, Digital Literacy and Digital Competence

In the contemporary era, the term *digital* is widely used and sometimes overused. It is pervasive and is associated with the use of technology, including computers and other devices. This domain encompasses three fundamental concepts: digital nativeness, digital literacy and digital competence. The first notion, *digital native*, was first considered by Prensky (2001), who claimed that people born in the 1990s and later are fluent in digital user interfaces, "as opposed to older generations, who must be *immigrants*" (Reinhardt,

2022, p. 70). The true worth of this concept can be tested nowadays by looking at how young children, even very young infants, interact with digital devices.

The second notion, *digital literacy*, is closely related to the first concept, as it involves being able to operate comfortably in technologically enhanced environments in every aspect of life, including administration, accounting/banking, educational contexts, and informal situations (McGuinness & Fulton, 2019). This notion was criticised because it has been developed at the cost of other skills decisive to critical thinking (Littlejohn et al., 2012). However, Upor (2022) considers that digital literacy has “substantial educational and psychological benefits” (p.1) and includes, within its scope, capacities such as utilising data from different sources, applying electronic innovations or functioning successfully in technological settings. Nowadays, digital literacy is essential, and a lack of it may be limiting, as individuals can be excluded from many spheres of life and need to resort to external help, such as digital natives (Prensky, 2001). Alternatively, they may have to learn the basics of digital technology and become *digital immigrants* (Prensky, 2009), bridging a gap which has been associated with younger versus older generations.

Third, *digital competence* (DC) was defined in 2006 by the European Union as one of the eight key competences for lifelong learning (DO L394, 2006). It refers to the skills and literacies needed to be able to learn and navigate in a digitalised knowledge society (Ilomäki et al., 2016). The notions of digital competence and digital literacy have been used interchangeably, and in the Digital Education Action Plan (European Commission, 2018a, 2018b), no distinction is made between the two terms. However, there are slight differences between them, pointing to a shift in focus. Digital literacy has been used longer, generally for research, and originally, it was connected to reading and writing, or in other words, how individuals are able to communicate through technologies. Digital competence, on the other hand, is more widely used nowadays in policy and educational documents, with a focus on the professional or educational use of technology as a transferable skill.

Digital Competence Frameworks for Educators

Within Europe, and before the COVID lockdown, the notion of digital competence has been developed in several documents to align it to the shifting arena of 21st-century technological challenges. The European Digital Competence Framework (DigComp) was originally developed in 2013, with the last version in 2017. It aimed to understand and develop the notion of DC, considered as the skills citizens must have to integrate into a digital society successfully. In 2015, still within the European framework, the Digitally Competent Educational Organisation document (DigCompOrg) was published with the aim of facilitating the digitalisation of educational organisations in a systematic way. It was also addressed to educational authorities and institutions.

The third outcome of this framework, specifically addressed to the field of teaching and learning, is the European Framework for the Digital Competence of Educators (DigCompEdu), advanced in 2013 and with a revised version in 2017. It includes a framework with 22 educator-specific competences, which are organised in 5 areas – namely, information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving– and follow a cumulative progression of 6 proficiency levels (A1 to C2) (Redecker, 2017). This framework is similar in organisation to the Common European Framework for Languages (CEFR) (Council of Europe, 2001), but, differently from the CEFR, it describes every aspect of digital competence from a pedagogical perspective. Since its publication, DigCompEdu has been integrated into training courses and guidelines for teachers and learners, and is being used in different schemes and initiatives.

Currently, organisations such as the International Society for Technology in Education (ISTE²) provide a roadmap for accelerating digital transformation in schools and support different types of events, resources and certifications based on the six-level scale of the DigCompEdu.

In Spain, the notion of digital competence has also been addressed in the last two educational legal frameworks established for primary and secondary education (LOMCE: MECD, 2015; LOMLOE: MEFP, 2020; 2022). The LOMCE already contemplated DC as one of the *seven* competences to be achieved, putting forward a comprehensive view of DC based on the DigComp framework and suggesting “going beyond digital literacy” (MECD, 2015, p.531). However, its main focus was helping learners access information and use technologies. The present law (LOMLOE: MEFP, 2022) considers DC as one of the *eight* key competences, and makes reference to the five areas of digital competence developed in DigCompEdu (Royal Decree 217/2022, for secondary education; Royal Decree 243/2022, for upper secondary education).

Supporting this promotion of DC in the Spanish educational context and in line with international organisations such as the ISTE, the *Instituto Nacional de Tecnologías Educativas y de Formación del Profesorado* (INTEF³) was created with the aim to promote the development of new technologies “as a factor of quality in the Spanish education system” (Estévez-Carmena, 2023, p.3), and its final aim is to empower all types of educational stakeholders, and not only learners, to go beyond a traditional use of ICTs (Pérez-Navio et al., 2021). In Estévez-Carmena’s words (2023, p.3), initiatives within this institute answer to the need to take into account “The changes produced in our society in the field of digitalisation and its impact, accentuated if possible, even more so, as a result of the COVID-19 pandemic and the new methodologies implemented in education.”

²<https://iste.org/standards>

³https://aprende.intef.es/sites/default/files/2018-05/2017_1024-Common-Digital-Competence-Framework-For-Teachers.pdf

Besides its inclusion in the Spanish educational laws and its promotion through diverse initiatives within the INTEF (2017), knowledge of educational stakeholders' Digital Competence has been researched extensively, particularly around and after the COVID lockdown, in obvious answer to the new educational demands. Right before the COVID lockdown, Hinojo-Lucena et al. (2019) pointed at permanent teachers' lack of digital knowledge, concluding that their perceptions of this knowledge are affected by their age, gender, qualifications and experience. Recent studies (Pérez-Navío et al., 2021) have confirmed this lack of digital competence for educational uses beyond the traditional use of ICTs. Outside the Spanish context, Zhao et al. (2021), analysing findings from 2015 to 2021, corroborated this basic/low level of DC for teachers and students in Higher Education. Also supporting this conclusion, Basantes-Andrade et al.'s (2022) meta-analysis revealed the need to foster tertiary teachers' digital abilities dealing with four different domains: technical, pedagogical, safety and critical skills, balancing the four digital dimensions. Specifically in the case of future secondary school teachers, Tárraga-Mínguez et al. (2021) explored DC findings between 2011 and 2021, suggesting there is a need for more training in the *pedagogical* usage of digital resources to reduce the gap in their competence for classroom uses. The study also confirmed previous findings, namely, that pre-service teachers' perception of their digital competence is affected by their gender and their age. While research findings suggest men perceive themselves as more competent than women and younger people have higher self-perceived skills (Alfárez-Pastor et al., 2023), there is a mismatch between their perceptions and their actual digital skills/usage, particularly regarding their pedagogical knowledge. That is to say, believing that one has good technical skills does not mean being able to integrate ICTs into the lessons, a finding that is confirmed in other studies (Alfárez-Pastor et al., 2023; Pérez-Navío et al., 2021; Tárraga-Mínguez et al., 2021).

Additionally, Alfárez-Pastor et al. (2023) specified the areas in which educators' digital skills were less developed, such as content creation, security, and problem-solving. This finding aligns with the meta-analysis of Basantes-Andrade et al. (2022). In conclusion, current studies show that (prospective) teachers need further training to reduce the gap between their technical and pedagogical digital skills, enabling the real integration of ICTs into their classroom practice safely and critically. A relevant model for reducing this gap is the TPACK framework.

Addressing Technological, Content and Pedagogical Knowledge: the TPACK Framework

The studies revised in section 2.2 emphasise the importance of digital competence as one of the challenges facing teachers today. While these studies mentioned above use the DigCompEdu framework to analyse the digital skills of educational stakeholders, the TPACK framework (Technological Pedagogical Content Knowledge) (Mishra & Koehler, 2006) is an alternative scheme that helps analyse how valuable a given technology may be for an educator in their classroom practice, rather than making a comprehensive evaluation of the educators' DC.

TPACK, adopted from Shulman's (1987) PCK (Pedagogical Content Knowledge), adds technological knowledge to Shulman's model. However, this framework is not just a simple sum of knowledge in the three areas. In Mishra and Koehler's words (2006, p. 1029):

[A]n understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones.

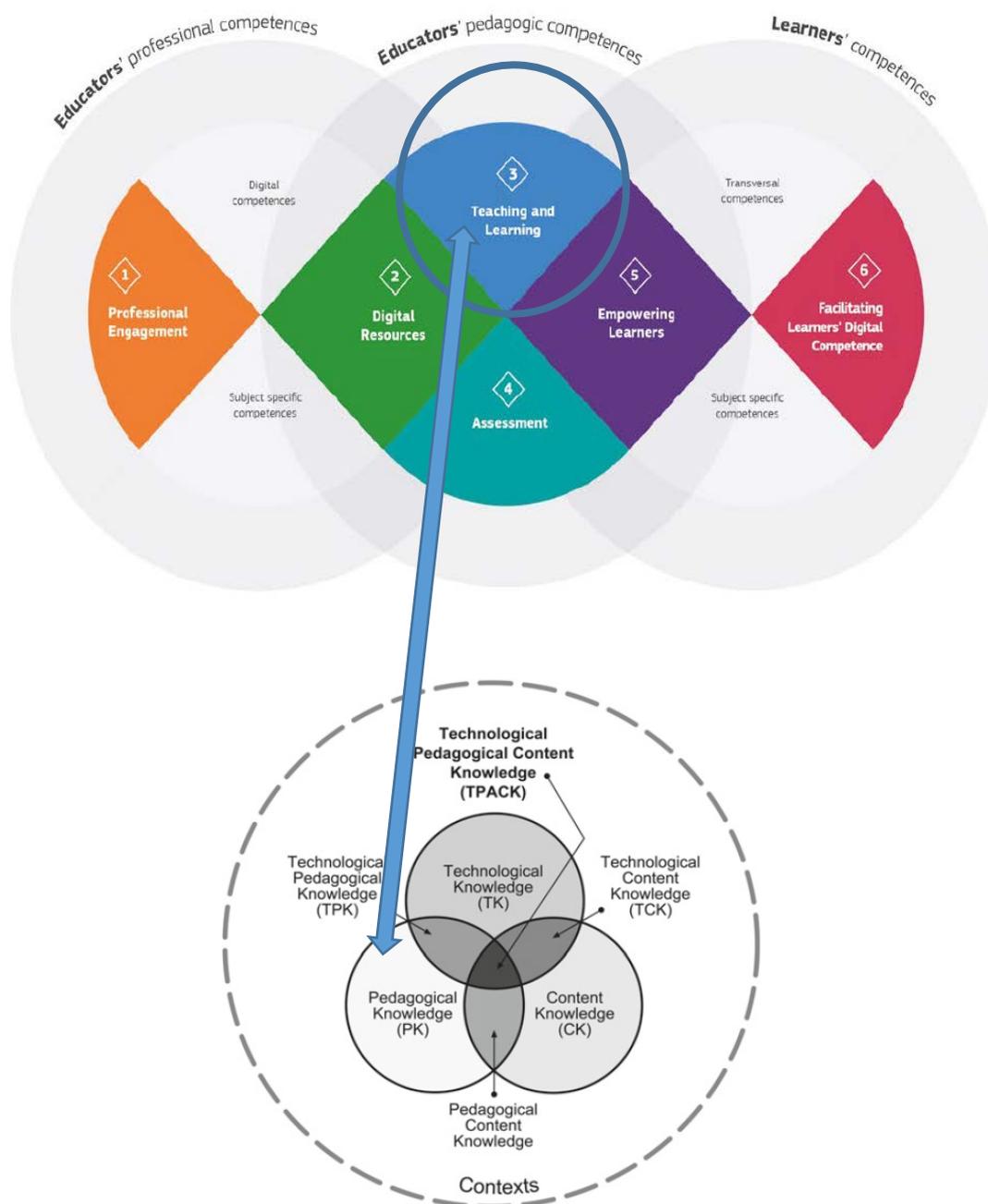
Upor (2022) adds that the TPACK framework may enable the transfer of digital skills (DigComp) from non-academic to academic contexts (DigCompEdu).

While the final aim for both frameworks is fostering innovation in education, the DigCompEdu is wider in scope regarding the pedagogical dimension, as the three circles in the first figure show the type of educational stakeholders and the multiple interactions it addresses. However, it leaves out technological (TK) and content knowledge (CK), contemplated in the TPACK framework, and essential to evaluate how a given technology, app, for the purposes of this work, may be suitable or not in a particular educational context. In other words, when a teacher comes into a classroom and wants to use a certain technology, they must have a certain degree of DC. However, they must also be able to evaluate a) whether the content dimension of the technology/app to be used is aligned with the subject/teaching guidelines, on the one hand, and b) whether the technical specifications are up to standard. Obviously, the pedagogical dimension is also essential and should be included within this evaluation/analysis of a given technology.

TPACK has been and is still used mainly to help pre-service and in-service teachers integrate technology in the classroom as a framework for pedagogical development (see, for instance, meta-analyses by Balladares-Burgos & Valverde-Berrocso, 2022; Liando et al., 2023; Mariette, 2022), but also for research (see Gómez-Trigueros & Yáñez de Aldecoa, 2021, for pre-service and in-service teachers; Su, 2023, for EFL teachers; Upor, 2022, for English pre-service teachers). Attending only to studies around and after the COVID lockdown, the main findings suggest that female participants have less predisposition to use technology and a lower perception of their DC (Gómez-Trigueros & Yáñez de Aldecoa, 2021), confirming results from the DigCompEdu (see previous section). The reason for this gender gap might be the lack of female models in the field of technology. Additionally, digital experience seems to outweigh age as a determining factor in integrating technology into educational practices (Upor, 2022), which also supports DigCompEdu research.

Figure 1

A Comparison of DigCompEdu (Redeker, 2017, p.15) and TPACK (Koehler et al., 2013, p. 103)



Thus, the TPACK framework can help teachers develop a critical stance towards digital media, if explicit training, reflection and evaluation of ICTs is carried out, especially considering the fast development of technology and the huge market of apps available. Likewise, research related to both the DigCompEdu and the TPACK frameworks may shed light on how DC is affected by certain variables, such as age, gender or experience. Besides, these schemes may enable (pre)service teachers to become aware of their attitudes towards technology and decide what, when, which, (and whether) an app is

appropriate for their classroom practice.

In the words of Kukulska-Hulme (2021, p. 4), DC models should “make greater efforts to interpret for education leaders available and reliable evidence concerning appropriate uses of learning technology in education as well as providing evaluation frameworks that will help detect those aforementioned ‘gimmicks’”. Following this line of thought, this study is aimed at raising pre-service teachers’ awareness of a subset of technology, language learning and teaching apps, to be used in their future classroom, also fostering their analysis and evaluation of apps for teaching by means of a checklist (Luque-Agulló & Almazán-Ruiz, 2023).

Methodology

After creating the checklist and introducing it as a tool for evaluating the educational value of language teaching apps, the next step was determining if it could be effectively used as a valuable teaching resource in an actual classroom. Likewise, the primary goal was to assess whether the checklist was user-friendly for students and if they believed it could be employed as a teaching aid.

Context and Research Questions

This small-scale research was conducted at the University of Jaén during the first semester of the academic years 2020-21 and 2022-2023. Participants were purposefully selected, as they were the students of two classes in the fourth year of the Degree in English Studies, enrolled in an elective subject intended to prepare future English secondary teachers. The subject in which the study took place is *Materials and Methods in Language Teaching*. The following final aims were established as *pedagogical objectives* of the course subject:

- To raise pre-service teachers’ awareness (and grant them a tool) on research-based criteria to select (or not) apps for their future practice.
- To help pre-service teachers integrate the use of apps for teaching and learning inside and outside the language classroom.
- To gather a database of apps suitable for pedagogical uses, given the speed at which technologies develop.

Part of our motivation for carrying out this study was to know the students’ perceptions of the checklist used to assess the potential educational value of mobile apps. Connected to this question and the pedagogical objectives, we also wanted to know whether perceptions about the pedagogical use of digital resources (apps) had shifted after the COVID-19 lockdown, which had forced many teachers to update their digital skills in record time and pushed them to rely on them for teaching in online environments. Thus, we formulated the following research questions.

RQ1: How effective and intuitive is the checklist for assessing the usability and educational value of language learning and teaching apps?

RQ2: To what extent have pre-service English teachers' perceptions of the pedagogical value of apps evolved after the COVID-19 lockdown?

Research Procedure

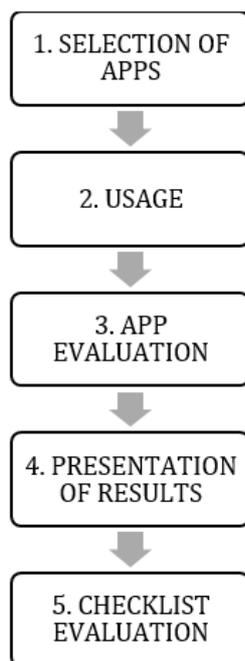
The procedure for carrying out this research consists of several stages, as it was part of the teaching process of the subject mentioned above. Figure 2 summarises the five-step process, which is then explained in detail.

Firstly, students had to choose two mobile apps suitable for learning and teaching English as a foreign language (see first section in Figure 2). Although students had the freedom to make their own choices, they were required to select one application that appealed to them and another that did not. They had to upload their choices to a classroom forum and check that their selected apps had not been chosen by other students. An additional criterion that had to be satisfied is that apps should be suitable to be used for learning and teaching English as a foreign language, although they did not have to be designed explicitly for pedagogical purposes (see the distinction of dedicated language learning apps and generic apps, following Almousawi, 2021).

Secondly, a session of classroom time was devoted to introducing the checklist they would use to evaluate the mobile apps, explaining all its sections and the procedure to use it. The third step involved using the checklist (Luque-Agulló & Almazán-Ruiz, 2023) to evaluate the educational potential of both language learning apps. The final goal was to assess the effectiveness of using the checklist as a tool for teachers when deciding whether to integrate a specific app into their teaching practices.

Figure 2

Five-Step Classroom Process for Checklist Use and Evaluation



Fourthly, after using the checklist to analyse the two apps they had chosen, students presented their results and uploaded them to a Google Drive folder so that all classroom participants had the analysis of all the apps selected, facilitating their potential classroom use or rejection in their future practice.

Finally, we aimed to gather the students' viewpoints in order to assess the checklist and ascertain whether they deemed any modifications necessary. For this purpose, a questionnaire with a combination of Likert scale questions and open-ended questions was designed to gather the necessary information effectively. The questionnaire was developed using the Google Form⁴ software. Students were required to answer this questionnaire during a course session as the last step in this process.

Participants and Variables

A total of 72 students participated in the activity designed to evaluate the effectiveness and usefulness of an app using a checklist. However, only 54 of them completed the Google questionnaire, which was used as an instrument to analyse their perceptions based on the checklist. In terms of gender, female students accounted for 72.2% of the sample, significantly outnumbering their male peers, who accounted for 27.8%. Table 1 shows the distribution of the participants by gender and according to the academic year in which they completed the questionnaire.

Table 1

Distribution of Participants by Gender and Academic Year

	2020		2022	
	N	%	N	%
Male	11	30,6%	4	22,2%
Female	25	69,4%	14	77,8%
Total	36	100%	18	100%

The variable of the academic year was considered in answering both research questions, which allowed us to determine whether there were significant differences in perception between students who used the checklist immediately after pandemic-imposed confinement and those who used it two years later. Thus, the academic year becomes a relevant variable in this study as it aims to compare students' change of perceptions between 2020 and 2022. This variable allowed us to analyse whether significant differences in student perceptions can be attributed to contextual factors that vary between 2020 and 2022, such as the impact of the lockdown in 2020 and changes in teaching and learning modalities implemented in subsequent years. In this way, the academic year becomes a time variable reflecting the particular circumstances of each period.

⁴ <https://forms.gle/AsQpp6YvXryY3jbs6>

Instrument, Data Collection and Data Analysis

This study serves as an example of primary research, as defined by Brown (2001), and employs a questionnaire as its primary data collection instrument. The questionnaire, carefully designed to gather relevant information, consists of ten items that aim to depict the participants' perspectives and experiences. By using this tool, the study seeks to obtain direct, first-hand data from students, ensuring that the insights reflect their actual perceptions and attitudes regarding the checklist used to evaluate the potential educational value of a concrete app.

The statements were formulated following Brown's (2001) guidelines for questionnaire design, resulting in clear and concise statements. Additionally, straightforward questions were included to facilitate the collection of responses that could be analysed qualitatively. An intermediate level of English was used throughout the questionnaire to ensure that all participants easily understood the content. Two experts were consulted to validate the questionnaire and ensure the clarity and comprehensibility of its ten items. After enquiring about demographic data, the questionnaire included ten items, two of which used a ten-point Likert scale ranging from (1) *not effective/not clear at all* to (10) *very effective/very easy to use*. The remaining items consisted of a Likert scale with three or five possible responses, and short open-ended questions in which students were asked to elaborate on their previous answer.

Data collection was conducted during a course session after all the students had used the checklist to evaluate apps, presented their results and uploaded them to the classroom platform. Students were required to complete the questionnaire using their laptops or mobile phones. Completing the survey took no longer than fifteen minutes.

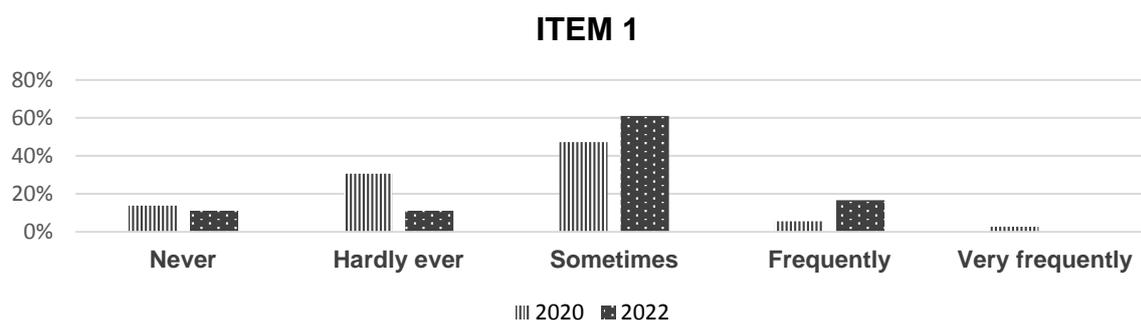
The questionnaire evaluates students' perceptions using a Likert scale for certain items as well as open questions, which incorporates a qualitative dimension to the study. It is also regarded as quantitative due to the statistical analysis performed on the data collected. The responses gathered from the questionnaire were processed using Microsoft Excel and then analysed statistically with IBM's Statistical Package for the Social Sciences (SPSS), version 27.0. Additionally, descriptive frequency statistics were employed to interpret the results effectively.

Results and Discussion

In this section, the questionnaire results are presented, and their implications are thoroughly discussed. In line with other studies that deal with pedagogical use of digital resources (Alfárez-Pastor et al., 2023; Pérez-Navío et al., 2021; Tárraga-Mínguez et al., 2021; Zhao et al., 2021), (RQ₁) enquired about *how effective and intuitive the checklist is for assessing the usability and educational value of language learning and teaching apps*.

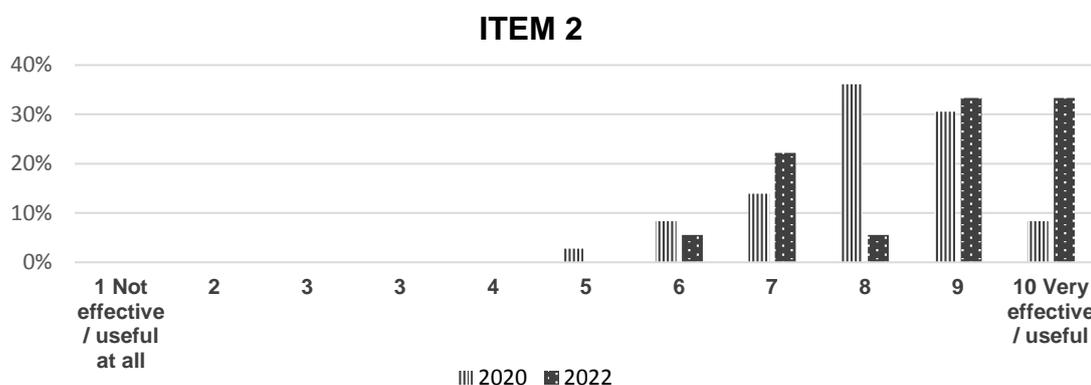
The items included in the questionnaire were designed to evaluate the versatility and effectiveness of the checklist in assessing potential apps for foreign language teaching and learning. However, we were also interested in knowing how frequently our students used mobile applications to learn English. As shown in Figure 3, option number (3) *sometimes* emerges as the most prominent answer for Item 1 in both academic courses (47.2% in 2020 and 61.1% in 2022). Nonetheless, the mean values of the responses are quite comparable across both classes, with results of 2.53 in 2020 and 2.83 in 2022.

Figure 3
Item 1 (Have you ever used apps to learn English?)



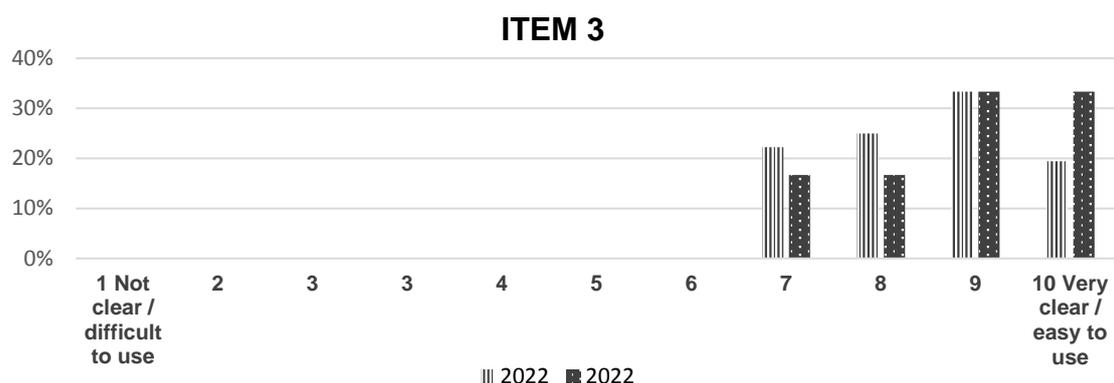
Responses to Item 2 report participants’ perceptions regarding the general effectiveness and usefulness of the checklist. As depicted in Figure 4, both groups rated the checklist’s effectiveness and usefulness predominantly above 7 points on the Likert scale in 2020, while the 2022 group rated it above 8. In the year 2020, the mean value was recorded at 8.08, which significantly increased to 8.67 by the year 2022. The observed increase in the mean value can be attributed to the heightened recognition of technology’s significance, particularly after several years of the COVID-19 pandemic. As a result, the importance of digital tools has come to the forefront in the educational context. The findings indicate that the checklist is regarded as an effective and valuable instrument for teachers to assess the educational potential of a given app.

Figure 4
Item 2 (How effective/useful the checklist is to evaluate apps for teaching)



Likewise, Item 3 addresses the organisation and perceived clarity of the checklist. Similarly to the previous item, a ten-point Likert scale was used to measure participants' perceptions. As illustrated in Figure 5, the values range from 7 to 10 on this scale. It is noteworthy that the 2022 group assigned a higher rating to the checklist clarity compared to the 2020 group. The mean values obtained in both groups are remarkable, as they both exceed a threshold of 8. Specifically, the mean for the 2020 group is 8.5, while the mean for the 2022 group is 8.83.

Figure 5
Item 3 (How clear the checklist is to evaluate apps for teaching)



After asking participants about the perceived degree of clarity of the checklist, Item 4 consisted of a short open question requesting respondents to give reasons for their answer, namely, saying why they considered the checklist to be clear or unclear. Table 2 shows the answers mentioned arranged by topic and frequency, from the highest to the lowest number of responses, and from positive to negative answers. As shown, both groups agreed on expressing the completeness of topics, concepts, and easiness of use, on the positive side, whereas both expressed some difficulty in understanding some technical concepts. The difference between the answers of the two groups can be seen in the higher specificity of answers related to technology provided by the 2022 group.

Table 2
Answers to Item 4

Say why the checklist is clear/unclear	
2020	2022
<ul style="list-style-type: none"> ● Completeness of topics, concepts, skills, knowledge ● Clear, easy and quick to be understood and completed ● Helpful for reflecting on the teaching framework ● Difficulty in understanding some concepts (technical words & expressions), too much information, ambiguity, repeated aspects 	<ul style="list-style-type: none"> ● A lot of detailed information about app affordabilities ● Effective to illustrate the content of each of the apps and evaluate them, clear and well structured, easy to use ● You can take into account things that we don't consider when we use them ● Difficulty in understanding some words and sections, even when translating them

After assessing the effectiveness and clarity of the checklist, we wanted to gather participants' opinions on its content. In Item 5, participants were asked whether they considered it would be beneficial to add any additional items to the checklist, using a three-point scale for their response. The results (cf. Fig. 6) indicate that while a significant portion of participants remain undecided and choose option 2 (*I don't know*), a considerable majority (44.4% in 2020 and 66.7% in 2022) consider that no additional items should be added to the checklist.

Figure 6

Item 5 (Would you add any other item to the checklist?)



Only 22.2% of participants in the 2020 group indicated a willingness to propose additional items, which had been requested in Item 6. They mentioned the inclusion of diversity aspects, cooperative activities, and curricular aspects in the checklist and whether examples are provided. We should emphasise that these additional items are not specifically related to technology. No respondents in the 2022 group expressed an interest in suggesting any further aspects.

Besides, it was relevant for the study to determine whether the students believed it would be advantageous to eliminate any items from the checklist. Hence, to address this concern, a question was incorporated in Item 7 of the questionnaire, using the same three-point scale applied in Item 5. As depicted in Figure 7, a significant majority of students from both groups (83.3% in the 2020 group and 88.9% in 2022) expressed that they did not consider it appropriate to remove any items from the checklist.

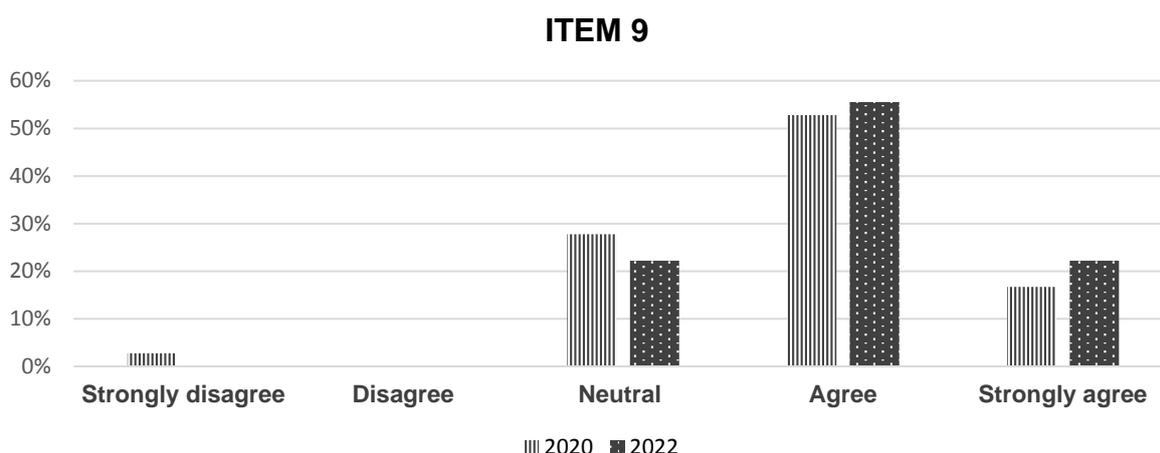
The results also indicate a decrease in hesitation among participants, with only 5.6% of students in both groups expressing a preference for the removal of items from the checklist provided for Item 8. In fact, there were just two answers in the 2020 group, suggesting the removal of the items about data required and preparation time, and one for the 2022 group, relating to whether the app needed webcam use.

Figure 7
Item 7 (Would you remove any item from the checklist?)



Item 9 deals with the participants' current intention to use the checklist in their future practice. Consequently, a five-point Likert scale was employed for this item to measure the extent of agreement or disagreement with the given statement. Although both groups manifested a clear intention to use it, there were participants in the 2020 group who reported they would not use it or were ambivalent (neutral) to their use. This could be explained by the fact that some pre-service teachers' attitudes towards ICT pedagogical use were not seen as a necessary occurrence in 2020, as they had turned out to be since then (Upor, 2022; Su, 2023), a result that also explains (RQ₂). In terms of mean values, both groups showed closely aligned results. It is noteworthy that the mean for the 2020 group is recorded as 3.81, whereas the mean for the 2022 group is reported at 4.00.

Figure 8
Item 9 (I will use this checklist in the future when working as a teacher)

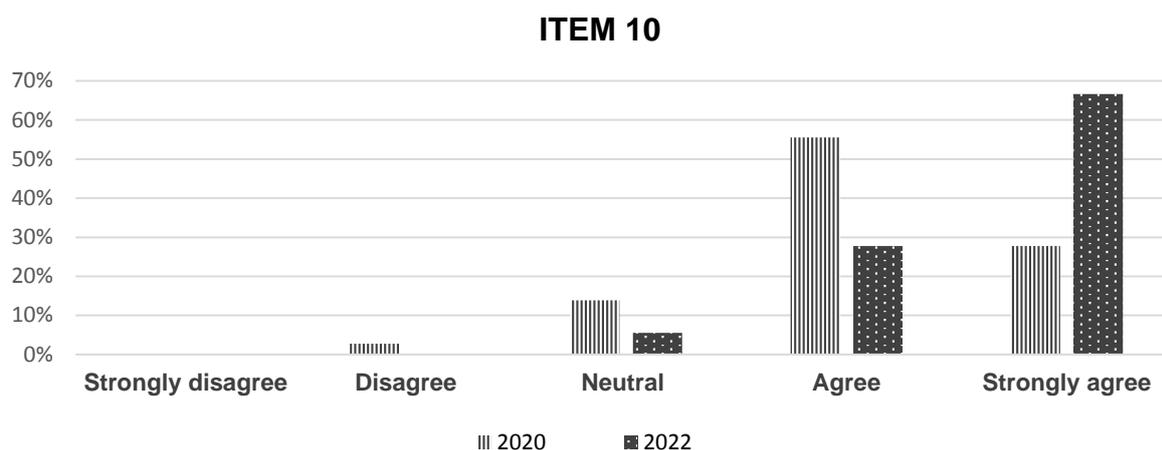


Finally, Item 10 asked participants to determine the checklist's effectiveness in evaluating apps for teaching and learning English. The results shown in Figure 9 depict that in the 2020 group, only 2.8% did not consider the checklist to be effective. However, 14% of the

participants were neutral about its effectiveness, while 56% agreed and 28% strongly agreed. In contrast, in the 2022 group, 67% of the participants strongly agreed, 28% agreed, and only 5% were neutral to its use. Both groups achieved very high mean values. Notably, the mean for the 2020 group is 4.08, while in the 2022 group, it is 4.61.

Figure 9

Item 10 (This checklist can be an effective tool to determine the usefulness of an app in teaching English as a foreign language)



Thus, and according to the results obtained, the 2022 group may have perceived a heightened necessity for analysing and evaluating apps by means of an easy-to-use checklist. This need likely arises from their potentially increased use of apps (Alferez-Pastor et al., 2023; Pérez-Navío et al., 2021; Tárraga-Mínguez et al., 2021), a wider range of apps choices, expanded digital experience (Upor, 2022) and, consequently, because of participants' shift of attitudes towards ICT use in the classroom (Su, 2023).

Again, these results may also be explained by considering the TPACK framework. Upor (2022) discussed how an enhanced digital experience predicts the integration of technology into educational practices. We would add that 2022 participants may have shown an *increased* level of digital experience after the COVID lockdown due to the proliferation and fast-changing nature of technologies in educational contexts in general (Kukulska-Hulme, 2021; Reinhardt, 2022) and in their specific learning/teaching context. Once more, this finding also explains Research Question 2, commented on next.

As regards (RQ₂), *to what extent have pre-service English teachers' perceptions of the pedagogical value of apps evolved after the COVID-19 lockdown*, data shown in Figure 2 (Item 1) reflect the tendency for an increased use of apps for learning English, as reflected in the line for the 2022 results, where never or hardly ever using apps stands for less than 10% versus the 30% of hardly ever in 2020. On the other extreme, 2022 results show more than 10 points of difference with 2020 reported results in using apps sometimes and frequently.

This shift in perceptions is also supported by Items 2, 3 and 10. The results of Item 2 (see Fig. 3) indicate a higher rating for the general effectiveness and usefulness of the checklist in 2022 (points 9 and 10) compared to the 2020 group (point 8). It may be explained by arguing that the 2022 group was potentially more predisposed to using apps, in turn bearing in mind the criteria commented on in the checklist. Likewise, results shown in Figure 4 (Item 3), which enquired about the clarity of the checklist, point to higher ratings for the 2022 group, perhaps because of an increased (potential) use of apps predisposed/inclined subjects for a more comprehensive view of the checklist. The same conclusion could also be drawn from the results shown in Figure 9 (Item 10). Namely, the 2022 group strongly agreed that the checklist is effective for determining the usefulness of an app for teaching. In contrast, the 2020 group just agreed or was neutral to its usefulness, maybe because a lesser/reduced pedagogical use of apps would involve not really needing to evaluate apps with a checklist. Thus, in general, research within the DC and TPACK frameworks (Alfárez-Pastor et al., 2023; Upor, 2022; Su, 2023) confirms the shift in attitudes shown in this study, together with a perceived higher need for evaluation of digital resources as a function of an increased integration of technologies in the classroom.

Conclusion

This work aimed at finding out pre-service English teachers' perceptions on how effective and intuitive a checklist (Luque-Agulló & Almazán-Ruiz, 2023) is for assessing the usability and educational value of language learning and teaching apps (RQ₁) and to what extent participants' perceptions of the pedagogical value of apps have evolved after the COVID-19 lockdown (RQ₂).

In order to do so, the paper describes a classroom study with two groups of pre-service teachers, in the academic year 2020/21, after the COVID lockdown, and in 2022/23, with physical teaching. As part of a classroom project, participants had to use a checklist (Luque-Agulló & Almazán-Ruiz, 2023) to evaluate apps to be potentially used in their future classroom practice and then analyse its clarity and usefulness (RQ₁) by means of a questionnaire. Pre-service teachers' perceptions towards the checklist (RQ₂) seem to suggest a shift in attitudes towards ICT use, as a higher predisposition for app analysis/evaluation in the 2022 group suggests more extensive ICT use and perhaps a higher degree of digital competence. Research around and after COVID lockdown confirms the tendency for a more widespread use of digital media as a function of increased experience (Alfárez-Pastor et al., 2023; Upor, 2022), a shift in attitudes (Su, 2023), and an overall need for raising teachers' awareness towards digital media use in their classrooms (Eisenmann, 2022; Kukulska-Hulme, 2021; Reinhardt, 2022).

When a teacher comes into a classroom and wants to use a certain technology, they must have a certain degree of DC. However, they must also be able to evaluate a) whether the content dimension of the technology/app to be used is aligned to the subject/teaching

guidelines, on the one hand, and whether the technical specifications are up to standard, as commented above. However, particularly important, a third stipulation involves acknowledging that “pedagogical considerations should always be given priority when integrating technology into language education” (Wu & Miller, 2021, p.32). Eisenmann (2022, p.212) confirms this need for “a good methodology to use edu apps in their (teachers’) individual classrooms.”

As previously commented, pre-service teachers must be able to take a critical stance with regard to digital media. This requires explicit training, reflection and evaluation of ICTs, helping them become aware of what, when, and which apps are pedagogically appropriate (by means of a checklist). Given the vast market of apps and considering that current educational tendencies promote the integration of ICTs in the classroom, particularly for the teaching of second/foreign languages, pre-service teachers need to become aware of the potential of apps for their pedagogical practice while maintaining a critical view.

In short, the classroom research introduced herein was intended to raise pre-service teachers’ awareness and grant them a tool on research-based criteria for evaluating the appropriateness of the apps for their future professional practice.

Nowadays, and to further complicate issues, especially for digital immigrants, many teachers are already using generative AI technologies as a tool in their teaching, in the design of the materials they use, and in their evaluation (Aaron et al., 2024). It would seem important to help learners and teachers become AI literate, on the one hand, and critically aware, on the other hand, by using the two frameworks discussed here, DigCompEdu and TPACK (Mishra et al., 2023) and by adapting the checklist (Luque-Agulló & Almazán-Ruiz, 2023) to be used in the analysis of generative technologies. This limits the applicability of the checklist and also of this study.

An additional limitation is that, as a purposeful classroom study, there was a reduced number of students, with uneven numbers between the two courses researched and incomplete participation in the questionnaire completion. Moreover, the potential inclusion of additional groups of students might also add data to confirm or reject our results. Despite these limitations, this type of study opens an invaluable window into what happens in actual classrooms, and it also fulfils the dual aim of researching pre-service teachers’ perceptions of the usefulness of a tool while increasing their awareness of the pedagogical use of technologies.

ORCID

 <https://orcid.org/0000-0003-1237-1549>

 <https://orcid.org/0000-0001-8724-6596>

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Data are available should readers request them.

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