Digital Competence Assessment Survey for Language Teachers

Mikhail Fominykh[1]([✉]) [iD], Elizaveta Shikhova[2]([✉]) [iD],
Maria Victoria Soule[3]([✉]) [iD], Maria Perifanou[4]([✉]) [iD],
and Daria Zhukova[2]([✉])

[1] Norwegian University of Science and Technology, Trondheim, Norway
`mikhail.fominykh@ntnu.no`
[2] ITMO University, Saint Petersburg, Russia
`{e.shikhova,dzhukova}@itmo.ru`
[3] Cyprus University of Technology, Limassol, Cyprus
`mariavictoria.soule@cut.ac.cy`
[4] University of Macedonia, Thessaloniki, Greece
`maria.perifanou@uom.edu.gr`

Abstract. In this paper, we present the results of the digital competence assessment survey for language teachers. The survey assessed how language teachers use digital technologies, their attitude towards these technologies, their related skills and competencies, their satisfaction and training needs, and the institutional support they receive. In total, 283 language teachers from 43 countries participated in the survey. The data were collected in 2019. The results indicate that language teachers use various computer-assisted language learning instructional methods. They generally consider that digital technologies are beneficial for the classroom. The lack of training prevents them from using specific technology-based methodologies, in contrast to the lack of technical infrastructure. The majority of the participants are not satisfied with their level of digital language teaching expertise. Two-thirds of those who receive digital competency training at their organizations, report that the training sessions happen irregularly or rarely. At the same time, the majority of the teachers confirm these training to be effective and the skills they received are applied in practice. We discuss the results of the survey in relation to the previous research, policies and practical challenges of the digitalization of language education. The major contribution of the paper is a representation of the teacher's perspective on the role of digital technologies in their practice. We assume that the new realia of teaching in the context of COVID-19 have changed the overall need in digital language teaching skills among the teachers, as well as the share of the teaching staff who teach online on a regular basis. The future work includes a new survey in order to evaluate the scope of this change.

Keywords: Digital competences · Language learning · Teacher education

1   Introduction

Digital skills and competencies are widely acknowledged as essential for modern citizens. Digital literacy was also highlighted as one of the key competencies for lifelong learning for more than a decade, for example, in the Digital Agenda for Europe in 2010 [1], and the Partnership for 21st Century Skills [2]. However, there is still a long way to integrate digital technologies or Information and Communication Technologies (ICT) to their full potential in language classrooms. The key findings of a large survey of schools in Europe were that the biggest percentage of European schools lacked the appropriate infrastructure, had low-frequency use of digital technologies in the classroom, and 70% of the teachers did not consider themselves as 'digitally' confident or able to teach digital skills effectively [3].

Furthermore, one of the major outcomes of the same survey was the urgent need to invest in training teachers, in addition to the investment in the digital infrastructure. The results of the same survey, published in 2019, indicated that around 60% of European students are taught by teachers that engage in professional development activities about digital technologies in their own time. The pandemic that started in 2020 has strongly influenced the teaching practices in a very short time. Learning shifted to an emergency mode, while the teachers had to quickly acquire new skills, especially in effectively using digital technologies. During these events, the results of studies and strategic recommendations to invest in training teachers can be seen in a new light.

Language proficiency is a key tool for common understanding between citizens, especially in culturally diverse regions, such as Europe. Language teachers need to acquire new skill sets regularly in order to become digitally competent. Those who aim to organize online language courses, need different skills than those trained to teach in a face-to-face classroom [4]. This modern educational reality even prior to the pandemic required innovative pedagogies, open digital learning environments, and open educational resources.

The application of technologies to language learning, and particularly the use of computers in language teaching has a history of half a century [5]. In his critical examination of the history and future of Computer Assisted Language Learning (CALL), Bax envisaged that CALL was going to be truly integrated into the classroom and into teachers' practices. He posited that the end goal for CALL should be 'normalisation' defined by the author as "the stage when the technology becomes invisible, embedded in everyday practice and hence normalised" [6]. Despite the progression observed in the last twenty years towards technology integration in language teaching, Bax's vision for CALL still remains an illusion. The present study aims to understand key factors that might play a role in technology integration, focusing on the language teachers and their digital skills. For this purpose, the research objectives of the study presented in this paper are:

1. to identify to what extent and how language teachers integrate novel technologies and methodologies in their teaching practices
2. to map their level of digital competences and skills
3. to understand their training needs on digital technologies to later prepare adequate and valuable training materials

Furthermore, the study presented in this paper was designed to support higher education institutions and other private and public organizations that need to improve the quality of their language study programs by providing a useful set of recommendations for language teaching in the digital era.

The survey presented in this paper was designed to provide the teachers' perspective on the digital competences in language learning. In a context of a larger study, the teachers' perspective was complemented by employers' expectations and a reflection on the European and national policies [7–9].

The paper is structured as follows. Section 2 describes the context of the study and the background. Section 3 presents the questionnaire that was designed for the study, the target groups, data collection process, and the data analysis methods. Section 4 presents the results of the study, structured by eight sections of background, level of teaching, instructional models, attitude towards digital technologies, competences in digital teaching, satisfaction with digital competences and need for training, institutional support for enhancing digital competences, and institutional aid for personal development. In Sect. 5, we discuss the results, analyzing how they fulfill the objectives outlined above. In Sect. 6, we present the limitations of the study, draw conclusions, and outline future work directions.

2　Background

2.1　Integration of Technologies and Methodologies in Language Teaching Practice

With the rapid development of technology in the last twenty years, the need for the inclusion of digital tools in second language practices has been addressed in several studies [10–13]. Research on teachers' integration of technologies started becoming stronger in the 2000s. An example can be found in Lam's qualitative study conducted in the USA to explore teachers' perceptions towards technological developments on education [11]. Lam reported that the main reasons that influence the adoption of technology are related to teachers' personal belief in benefits of technology, or lack thereof, rather than to a resistance to technology. She concludes stating that teachers should not be considered 'technophobic', and institutions, defined by Lam as 'technophilic', should not rush to obtain the latest innovations without considering the needs of teachers and students.

Albirini examined the attitudes of high school English as a foreign language teachers in Syria toward digital technologies [10]. His quantitative study investigated the relationship between computer attitudes and five independent variables: computer attributes, cultural perceptions, computer competence, computer access, and personal characteristics (including computer training background). Albirini concludes claiming that Syrian teachers have positive attitudes toward digital technologies in education. In particular, teachers' attitudes were predicted by computer attributes, cultural perceptions and computer competence. His results pointed to the importance of teachers' vision of technology itself, their experiences with it, and the cultural conditions that surround its introduction into schools in shaping their attitudes toward technology and its subsequent diffusion in their educational practice.

More recently, Sullivan and Bhattacharya carried out a qualitative study and analyzed how technology has been perceived and used by a language teacher in her span of twenty-year career as a foreign language educator [13]. The results revealed a complex negotiation process, a thoughtful reflection of advantages and disadvantages of technology integration in foreign language classrooms, and the value of understanding the cyclical nature of technology integration in education.

The successful integration of technologies in the foreign and second language classroom was and continues to be a very challenging task as it entails the selection of the appropriate teaching methodologies which can address specific linguistic needs. In fact, in order new educational technologies to be effective they need to be well supported by innovative pedagogical approaches which in turn could enable collaboration, communication and mobility [14]. To that end, there is a large body of research that investigates the use of computers and emerging technologies in the foreign and second language classroom known for the last 40 years as the field of CALL. What it revealed, though, is that there are no prevailing CALL theories. It is clear that the arrival of new technologies has driven the use of a "set" of theories which include a blend of known learning theories, linguistic theories, Second Language Acquisition theories, and human-computer interaction theories.

An effort to map the "CALL theories" was done by Warschauer and Healey [15] who divided 30+ years of history from 1960s to 1990s into three main phases: a) behavioristic CALL, b) communicative CALL, and c) integrative CALL matching different technologies to certain pedagogical approaches. The first phase stressed mostly the importance of behavior and promoted behaviorist language learning approaches such as drills and practice tasks. The second phase promoted mostly the communicative approach and the cognitivist approaches in both education theory and second language acquisition theories. Finally, in the third phase prevailed mostly the importance of the social contexts as preconditions for learning a language promoting the Computer Mediated Communication technologies along with Constructivist and Socio-Cultural Approaches and methods in foreign as well as second language learning such as the situated learning theory, the activity theory, scaffolding learning, collaborative learning, project-based learning, etc.

The third phase defined by Warschauer and Healey led soon to a more recent CALL phase which emphasised the use of web 2.0 tools, networking and the creation of communities of practice promoting Connectivism, an influential contemporary learning theory which "perceives learning as a process that is not entirely under the control of the individual and occurs within complex and lacking definite form environment knowledge needs to be connected with the right people in the right context in order to be classified as learning" [16]. A characteristic application of Connectivism is the connectivist type of Massive Open Online Language Courses which offer open access language courses to a massive number of language learners supporting interactivity, peer-to-peer learning, autonomy, social networking, openness and emergent knowledge [17].

During the last decade, CALL integrated many novel technologies (i.e., virtual learning environments, augmented reality, artificial intelligence, smart mobile apps, advanced computer-mediated communication tools) in the language teaching process and introduced various innovative teaching approaches such as problem-based learning [18], webquests 2.0 [19], game-based learning [20, 21] mobile assisted language

learning [22], virtual reality games in language learning [23], and tandem learning in telecollaboration [24].

Language teachers need to be well and constantly informed and trained on how to organize online, distance or hybrid language courses to be able to make best use of all these emerging technologies applying efficient and novel teaching approaches.

2.2   Language Teachers' Digital Competences and Skills

Language teaching is a very challenging task as it requires a sound grounding in disciplinary and pedagogical content knowledge as well as in technology knowledge obtained through constant professional development and practical experience. With the advent of technologies, the need for hybrid, online or distant language learning and for digitally competent language teachers has grown significantly. In fact, competency in the use of ICT is nowadays an integral part of a foreign language teachers' professional competency' [25].

Digital skills include technical and pedagogical use of ICT in education and training teachers with these skills contributes to improve the teaching-learning process [26]. Since 2005, Hampel & Stickler stressed that "teaching language online requires skills that are different from those used to teach language in face-to-face classrooms. It is also different from teaching other subjects online" [27]. To that end, Hampel and Stickler's proposed a "skills pyramid" framework, which intended to identify the key competences of an online language tutor proposing a pyramid of skills with seven key competences ranging from lower-level general skills (e.g., basic ICT competence) to higher level skills (i.e. facilitation of communicative competence).

Many more researchers investigated language teachers' distance training and tried to define the digital competencies and skills that language teachers should acquire [28–33]. Digital competence encompasses a set of skills that are associated with several areas of knowledge. For example, Zhao et al. proposed three knowledge areas which must be integrated: a) technology proficiency, b) pedagogical compatibility and c) social awareness [34]. Ferrari later defined digital competence as the "set of knowledge, skills, and attitudes […] required when using ICT and digital media to perform tasks; […] and build knowledge" [35].

Many researchers also discussed the role of distance language tutors emphasizing that they should be able to provide accurate feedback, encouragement, and support in such a way that the student feels 'reassured, valued and respected' [30, 31, 36]. A recent study [32] has shown that several factors such as collaborative learning, linking theories with practice, access to support and resources, scaffolding learning experiences, modeling ICT integration and assessment with ICT, practice through reflection-on-action, and collaborative learning can lead language teachers to obtain an advanced level of digital competence. This study has also shown that language teachers are "digital role models" and need to reflect on the ways they use digital technologies.

Even though digitally skilled language teachers are needed, there is still a reluctance towards the use of ICT. This seems to be a major barrier for the integration of digital technologies and their use in the language classroom [37]. In fact, in many cases (e.g., [26]) teachers still use the traditional method where the teacher is the transmitter of knowledge and the student is a mere passive recipient. Further analysis follows in the next section.

2.3 Language Teachers' Training Needs on Digital Technologies

Language teachers' integration of digital technologies in their teaching practices can be influenced by many factors [38]. Son and Windeatt consider teachers' training on the use of digital technologies as a key element in teachers' attitudes towards their use of these technologies in the classroom [39].

Several studies investigated the impact of training in digital technologies on language teaching practices from different perspectives [40–42], which include technology workshops, lectures on CALL, online courses, face-to-face courses specifically designed for a CALL certificate, and CALL master's degrees [43, 44]. Despite the wide range of language teacher training programs in digital technologies, Hong criticized that the number of courses and workshops are insufficient, and their quality is inadequate [45]. In the same line, Ertmer and Ottenbreit-Leftwich point out that even though teachers receive training on the use of technology, they are often incapable of integrating it in their teaching practices [46]. An explanation of this phenomenon was provided by Guichon who proposes that the technologies discovered during digital technology education programs become obsolete after teachers obtain certification and have the possibility to put into practice what they learnt during training [47].

In his study conducted with 108 TESOL master's degree graduates, Kessler found that not only informal training in digital technology through conference workshops, in-service training, personal reading and other forms of self-edification, but also formal instruction obtained during undergraduate courses as well as Masters' courses on the use of digital technologies do not serve the teachers' pedagogical needs, specifically when they need to create their own digital educational materials [48].

More recently, Soulé and Papadima-Sophocleous investigated CALL practices in the Cypriot Higher Education system and their relation to teachers' education in CALL and professional development [12]. The study was designed to assess CALL training, training for technology integration into the educational process, and CALL practices among second language instructors from public and private universities. The analysis of the data revealed a considerable variety in instructors' training, which ranged from in-service training, seminars, conferences, and lectures on CALL or CALL training as part of master's or doctorate programs. Despite this variety, the perception of instructors towards the training received for technology integration was generally positive, particularly in terms of its usefulness for the evaluation, selection, and use of computer-based instructional material. However, statistically significant differences were found among instructors according to their CALL training in terms of their perception towards effectiveness of training, leading to the creation of computer based instructional materials. Similarly, differences were found in the frequency of usage of mobile devices, website creators, wikis, and other social technologies.

The purpose of the present study is, therefore, to contribute to the description of the current situation of language teachers' integration of technologies and methodologies in their teaching practices, language teachers' digital competences and skills, and language teachers' training needs.

3   Method

3.1   Research Design

While designing the survey we pursued three main objectives, as described in the introduction: to describe how teachers use digital technologies in their everyday practice, to learn what their digital literacy level is, and what kind of training they need. These three objectives were transformed into five main topics of the survey. We aimed to find out the following:

- what instructional methods language teachers use in computer-supported language learning
- what attitude language teachers have towards the use of digital technologies
- how language teachers assess their digital competence level
- how satisfied language teachers are with their level of digital competences, and what their training needs are
- what language teachers think of the institutional aid in personal and professional development towards digital competences

3.2   Tool Design

The survey was designed for two target groups: (a) language teachers and (b) administrators and policymakers working in the area of language learning. Questions about the personal and professional background were included for both target groups in the same form, but all other questions were formulated differently to make them more relevant for the professional background of the respondents.

The data were collected with the digital tool EnjoySurvey. The questionnaire consisted of 48 anonymous closed multiple-choice questions. The logic of the questionnaire adjusted automatically with respect to the answers the participants gave.

Even though the survey addressed both language teachers and administrators working in the area of language learning, the number of respondents from the latter group is not sufficient to analyze the obtained data qualitatively. Therefore, in this paper we consider only data received from language teachers. The teachers answered in total 32 questions structured in eight topics (Table 1).

Table 1. Survey topics and question codes

Topics	Question codes
1. Personal and professional background	Q1, Q2, Q13
2. Level of teaching	Q3a-c, Q4a-d
3. Language learning instructional models	Q5a-k
4. Attitude towards digital tech in language teaching	Q6a-c
5. Competencies in digital language teaching	Q7, Q8
6. Satisfaction with digital competencies training & required improvement	Q9, Q10, Q10a-c
7. Institutional support for enhancing digital competencies	Q11
8. Institutional aid for personal development towards digital competencies	Q12

3.3   Participants

In total, 283 language teachers answered the questions of the survey. The respondents were predominantly female (85%), while others were male (15%). The age distribution of survey respondents changed through five age groups: age bracket 17–25 year (4% of respondents), 26–35 (24%), 36–45 (36%), 46–55 (24%), and 56–65 (12%).

The majority of the teaching staff surveyed (46%) have indicated a master's degree as their highest level of education attained. Another significant cohort of the respondents (29%) have PhD-level education and other Doctoral degrees (9%). The next largest cohort (8%) have bachelor-level education. The option Certified/licensed professional was selected by 7% of respondents. Other options were selected by less than one percent.

The larger part of the teaching staff surveyed (40%) has been in the profession for 1120 years. The second-largest cohort of the respondents (22%) have been teaching for 2130 years. Close to the latter, with 19% of the respondents, is the group with 610 years in service. The respondents with 5 or fewer years in service represented 10%. And the respondents with more than 30 years in service - 9%.

The predominance of the teaching staff surveyed (69%) works at a university. A smaller but still sizable group of the respondents (19%) work at a secondary, middle, or primary school. Other respondents represent colleges (3%), vocational educational institutions (3%), self-employed (3%), policy-making organizations (1%), and lifelong learning and distant/online education institutions (1%).

The respondents stated that their employment organizations are located in 43 different countries. The largest number of participants located in Russia (36.7%), Czech Republic (8.1%), Cyprus (6.0%), Austria (4.9%), Italy (3.5%), Greece (2.8%), Serbia (2.8%), Norway (2.8%), Lithuania (2.5%), Finland (2.5%), Spain (2.1%), Japan (1.8%), Romania (1.4%), India (1.1%), Iran (1.1%), Portugal (1.1%), Turkey (1.1%), and in 26 other countries (less than 1% in each).

In this survey, we asked the language teachers about the cohort of students they teach (in respect of their language acquisition), and the majority of the teaching staff surveyed (63%) are foreign language teachers. Almost a quarter of the participants (24%) teach both students' first language and foreign language cohorts. And 13% of the respondents teach only students' first language.

3.4   Data Collection and Analysis

The data were collected from March to July 2019. The survey was promoted in the professional networks of the study collaborators, at their universities, and on social media.

The collected data were processed in R-programming software. The method of descriptive statistics was used for the data analysis.

4   Results

The results of the survey provide the language teachers' perspective on the digital competences in language teaching. This section is structured by the sections of the survey and refers to the codes of specific questions where necessary (Table 1).

4.1   Instructional Models

The majority (78%) of the teaching staff who participated in the survey teach their students face-to-face. More than half (59%) of the respondents in this category practice the blended learning model of instruction. A third of this category's respondents use the online/distance instructional model (Fig. 1). The participants could choose multiple options.
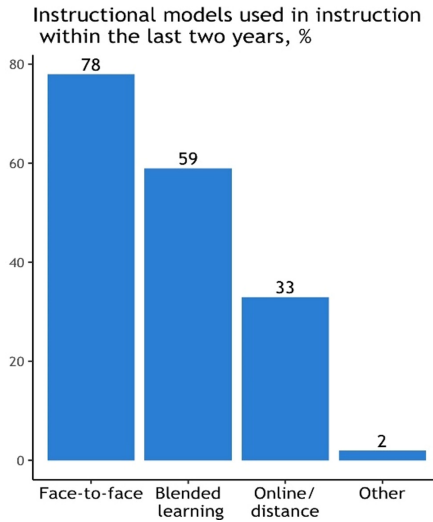

Fig. 1.   Instructional models used within the last two years (Q4)

4.2   Language Learning Instructional Methods

In Sect. 3 of the survey (Table 1), we evaluated the instructional methods that language teachers use in their daily practice. Survey question Q5 included 10 instructional methods most commonly used in CALL (Fig. 2). The response options included two positive alternatives, formulated as follows: "Use as the core methodology" and "Use as an auxiliary methodology". The response options also included three alternatives for not using the methods (see legend on Fig. 2).

The survey proved content-based learning and task-based learning to be the most used as core language learning methodologies. Game-based learning and project-based learning are the most used as auxiliary methodologies (Fig. 2).
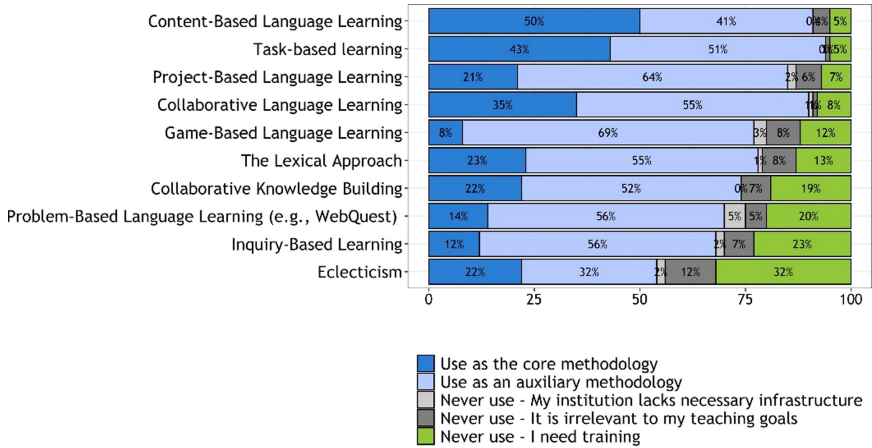

Fig. 2. Language learning instructional models (Q5)

The larger part of respondents has stated that they use all the educational technologies under consideration in their teaching practice, with eclecticism being used the least.

The lack of necessary infrastructure proved to have little influence on the teachers' motivation to use language teaching methodologies.

4.3 Attitude Towards Digital Tech in Language Teaching

In Sect. 4 of the survey (Table 1), the teachers were asked to state their overall attitude towards digital technologies in language teaching, as well as in the role these technologies play in the students' progress. The results showed that generally they agree that digital technologies enhance language learning and are beneficial for the classroom (Fig. 3, left). Nevertheless, the respondents rated the role of digital technologies in academic performance of their students as less positive (Fig. 3, right).
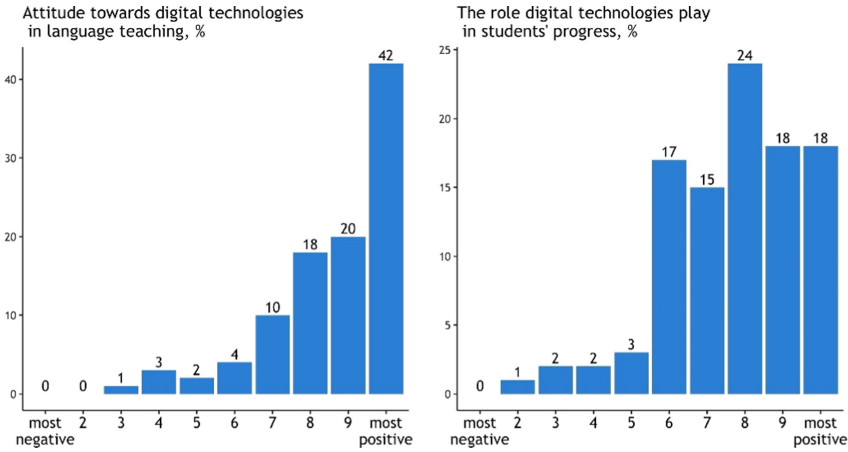
Fig. 3. Attitude towards digital technologies in language teaching (Q6b, left) and The role digital technologies play in students' progress (Q6c, right)

4.4   Competencies and Satisfaction with Competencies

In Sect. 5 of the survey (Table 1), language teachers who responded to the survey self-assessed their level of proficiency in using digital technologies, choosing from six levels (Fig. 4, left). A question in Sect. 6 of the survey (Table 1) about the kind of training the participants are interested in contained the same six levels (Fig. 4, right). Each of the six levels contained a detailed description for the participants (for example, Intermediate: *I am capable of using technically specific tools and devices […]. I also understand how to implement digital technologies in language teaching […]. I also try to enrich the variety of digital tools that I use in my language lessons and to introduce innovative teaching methodologies*).

The majority of the teaching staff surveyed (34%) identify themselves as belonging to the Intermediate group of digital language teaching experts (Fig. 4, left). The second-largest group of respondents (27%) identify their digital language teaching expertise as that of the Pre-Intermediate level, while the third-biggest percentage (22%) consider themselves as belonging to the Advanced group. Only 5% describe themselves as Proficient digital language teaching experts.

A relatively small number of language teachers identify themselves as complete novices (4%) and beginners (8%). In addition, very few require training at the beginner level (5%) and pre-intermediate level (6%).

Assessing if the participants are satisfied with the level of digital language teaching expertise, we suggested only two options in question Q9 (yes, satisfied and no, not satisfied). More than two-thirds of the teachers (71%) responded not satisfied to this question. The survey also asked if the participants believe that they can improve their digital language teaching expertise by participating in an external digital literacy training program in question Q10. The questions also included two answer alternatives: yes and no. The majority of the participants (95%) responded positively to this question.

Among those who believe that they can improve their digital language teaching expertise by participating in an external digital literacy training program, a majority (43%) are interested in Advanced-level training and 18% in Proficient, while almost a third (29%) would opt for intermediate-level training (Fig. 4, right).

The teachers who highly value the role of technology in teaching (those who opted to 8, 9 or 10 on a scale from 1 "negative" to 10 "positive", Fig. 3, left), noted more often that they need advanced training than those who believe that technology plays a mediocre role in teaching (those who have chosen 6 and 7 on the same scale).
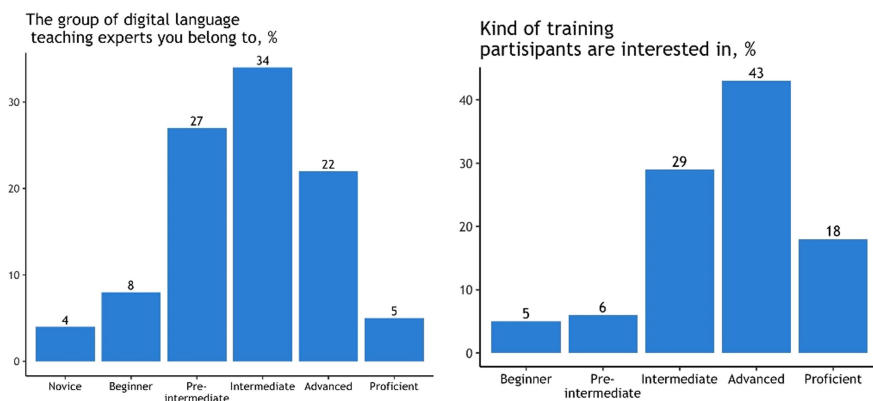

Fig. 4. The groups of digital language teaching experts you belong to (Q7, left) and Kinds of training participants are interested in (Q10a, right)

4.5 Institutional Support and Aid

In Sect. 7 of the survey (Table 1), we assessed the institutional support for enhancing digital competences of language teachers by asking about the availability and frequency of the digital literacy training provided by the respondents' employers.

Sizable part of the respondents (27%) reported that their employers never organize training for advancing digital skills, while approximately half of the participants (47%) responded that they have access to such kind of training in their workplace. (Q11). However, two-thirds of the respondents, who receive such training at their organizations, report that the training sessions happen irregularly (36%) or as rarely as once per year (29%). Only 21% of the teachers stated that their employers organize training regularly. At the same time, 63% of the teachers describe the training held at their employing organizations as effective and the skills they received are applied in practice.

Among the most preferable and effective ways to improve their level of digital literacy apart from the formal training, the language teachers named experience exchange sessions (34%). Other options included participation in CALL conferences (23%), participation in special interest groups (22%), and mentoring programs organized by the educational institutions (21%).

In Sect. 8 of the survey (Table 1), we studied the institutional aid for personal development towards digital competencies that the participants expect from their employing institutions.

The survey participants expressed their opinions on how their employment organization could contribute to improvement of their digital literacy level, additionally to training. The suggested means to facilitate the advancement of digital literacy were selected by the participants as follows. It was possible to select multiple answers:

- Allocate working hours for language teacher digital literacy development 54%
- Arrange a technical support service or equivalent 54%
- Create a digital literacy mentoring program 52%
- Ensure there is an adequate quantity of modern, reliable digital tools available 51%
- Provide classrooms fully equipped with latest technological devices 50%
- Allocate working hours for the development of digital courses and programs 50%
- Grant unlimited access to the equipped classrooms 30%

The teaching staff surveyed tended to choose the additional methods for achieving a higher level of digital language teaching expertise with approximately the same frequency, where two means slightly ahead of the others (see the list above). The method of granting unlimited access to the equipped classrooms emerged as the only unpopular option. At the same time, providing classrooms fully equipped with the latest technological devices was rated as high as other methods.

5   Discussion

5.1   Use of Instructional Methods and Attitude Towards Digital Technologies

Evaluating the instructional methods language teachers use in their daily practice, we received rather positive results. The participants replied that they use (either as a core or an auxiliary method) all 10 suggested instructional methods most commonly used in CALL (Fig. 2). The answers varied from the least used method Eclecticism (22% of participants use it as a core method and 32% use it as an auxiliary method, Fig. 2) to Task-based learning (43% of participants use it as a core method and 51% use it as an auxiliary method, Fig. 2). This means that language teachers use multiple and varied CALL instructional methods.

The data confirm that the most common reason for not using specific instructional methods was the need for training. It varied from only 5% for Content-based language learning and Task-based learning to nearly one third –32% for Eclecticism. Out of the ten instructional methods most commonly used in CALL, we identified four that require more training: Collaborative knowledge building, Problem-based language learning, Inquiry-based language learning, and Eclecticism.

The results might postulate a correlation between the data we collected and the problem of inadequate quality or level of courses and training that might still exist today, after it has been identified in multiple studies as early as a decade ago Hong [45] and even earlier by Kessler [48].

The results generally confirm the challenge of integrating digital technologies into language teaching practices that was identified earlier [46] and confirmed in multiple studies [3].

We evaluated the integration and use of different instructional methods together with the digital competences of language teachers. We followed the definition of digital competences by Ferrari [35] and considered that this set of skills includes both technical and pedagogical use of ICT [26]. And yet, the previous research shows that the integration of digital technologies and their use in the language classroom is a long process where many teachers are still reluctant to use digital technologies, which seems to be a major barrier [37]. Needless to say, the integration of digital technologies into language teachers' praxis can be influenced by many factors [38].

In the past, the *lack of digital infrastructure and services* has been considered a serious challenge [3]. The data we collected did not confirm that this is an important reason for not using specific instructional methods. According to the results of our survey, language teachers do not consider this obstacle to be essential, hence only 5% or fewer participants choosing it (Fig. 2). This discrepancy can possibly be related to the fact that the predominant majority of our survey participants (69%) were employed at universities, and only 19% worked at a secondary, middle, or primary school. In general, universities might have better digital infrastructure than schools, and thus overall results did not reflect lack of infrastructure as an important barrier. According to the data, the *need for training* is a much more common motive for not using specific instructional methods.

Exploring the attitudes of language teachers towards the use of digital technologies, we evaluated two main constituents: the frequency of use and the perceived effectiveness.

In a general question: "Your attitude towards digital technologies in language teaching", the responses were very positive – 80% in the most positive end of the Likert-scale (steps 8, 9, and 10 on Fig. 3, left). Language teachers generally see digital technologies as something that enhances learning and is beneficial for the language classroom. On this background, the results from a more specific question "The role digital technologies play in your students' progress", provide further insights. The respondents are still optimistic, but much lower than in the previous question: 60% answering in the most positive end of the Likert-scale (steps 8, 9, and 10, Fig. 3, right). Therefore, these results may point that language teachers did not use digital technology to its full potential. This can also mean that there is a gap between the current use and the potential that teachers believe that digital technologies should have for teaching and learning purposes. This confirms the need for training as a means to unitize the full potential of digital technologies.

The results of the survey presented in this paper (Fig. 3 and 4) correspond to the findings of Son and Windeatt [39], who perceive teachers' training in the use of digital technologies as a key element in teachers' attitude towards their use of these technologies in the classroom. The respondents who confirmed the high value of technology in teaching also were more certain that they want to advance their level of digital literacy, than those whose general attitude towards technology was less positive.

5.2   Language Teachers' Training Needs on Digital Technologies

The key finding that contributes to defining the training needs of language teachers is the *level of required training*. The analysis of the results of two survey questions: the proficiency level the respondents identify themselves with and the level of training the respondents are interested in (Sect. 4.3), both indicate that most language teachers have all basic digital competencies. This means that the demand for the basic CALL or digital literacy training is low among language teachers.

A recommendation on the level of digital competence training that is in demand among language teachers can be derived from the same results. The majority of the respondents identify themselves with the pre-intermediate and intermediate level, while the levels of training the majority of respondents are interested in are intermediate and advanced. These levels of digital language teaching expertise were defined as:

- Intermediate: *I am capable of using technically specific tools and devices, i.e. technical aspects and uses of interactive whiteboards, software for creating media, audio/video files and images, main uses of digital equipment, mobile devices, software for language learning, etc. I also understand how to implement digital technologies in language teaching using the right teaching methodology for every language need, i.e. collaborative tools like Padlet to enhance writing skills, video editing tools like Toondoo to enhance oral and writing skills, etc. I also try to enrich the variety of digital tools that I use in my language lessons and to introduce innovative teaching methodologies.*
- Advanced: *I feel confident using more advanced digital technologies, i.e. learning management systems (LMS), web 2.0 tools, mobile learning devices and applications for languages learning, etc. following the right language teaching methodology, e.g. I can independently create a blended LMS-based module on Moodle, Canvas, edX, etc. platform and train my students and colleagues in using the proposed technology.*

By looking at the level of satisfaction that language teachers show towards digital tools and the associated learning approaches (Sect. 4.4) and the improvement they consider necessary (Sect. 4.5), we can get further insight into the level of demand and characteristics of the required training.

In particular, most of the language teachers report that they are not satisfied with their level of digital language teaching expertise. At the same time, the majority of teachers believe that they can improve their digital language teaching expertise by participating in an external digital literacy training program. This result confirms previous findings by Soulé and Papadima-Sophocleous [12], who different training modes are seen as useful by language teachers (not only formal certified programs).

The result that the respondents, although generally positive towards using digital technologies in teaching, are not fully convinced about their usefulness for the progress of students (Sect. 4.3), indicates that they have not reached the full potential in using these technologies, as was previously reported [4]. These indicators correlate with the results for the *training needs of the teachers* (Sect. 4.4), from which we can conclude that organizing digital competence training for language teachers is potentially in high demand.

Furthermore, language teachers show interest (Sect. 4.5) in taking part in different training activities apart from formal training, specifically in experience exchange sessions. This indicates that language teachers need to have access to various kinds of training in order to implement novel technology-enhanced learning methodologies.

6 Conclusions

The major contribution of study presented in this paper is the description of the teachers' perspective on the use of digital technologies in language teaching.

For the objective of identifying to what extent and how language teachers integrate novel technologies and methodologies in their teaching practices, our results demonstrate (a) that language teachers use multiple and varied instructional models and (b) provide details on the use and challenges related to 10 CALL methods.

For the objective to map the level of digital competences and skills of language teachers, our results show that (a) most language teachers have all basic digital skills and (b) language teachers are positive towards using digital technologies in general but are less certain about the role of digital technologies in student progress, which indicates a gap between the current use and the potential that teachers see for digital technologies.

For the objective to understand the training needs of language teachers on digital technologies, our data show that (a) most language teachers are not satisfied with their level of digital language teaching expertise, which is most often pre-intermediate and intermediate and (b) the greatest majority of the teachers believe that they can improve their digital language teaching expertise, requiring most often intermediate and advanced-level training.

The limitations of the study include a relatively low number of participants. Although the participants represented 43 countries, more than a third of all responses came from a single country, while 26 countries were represented by only one or two respondents. In addition, many of the survey questions were asking the respondents to self-assess their skills, needs and practices. This should be considered when interpreting the results.

The study was designed and conducted before the start of the COVID-19 pandemic. We assume that the new realia of teaching in the context of COVID-19 have changed the overall need in digital language teaching skills among the teachers, as well as the share of the teaching staff who teach online on a regular basis. Future work should evaluate the scope of this change, investigating how language teachers use digital technologies in the new context, their updated attitude towards these technologies, and status of the related skills and competencies they have. We also propose to use qualitative methods to get a deeper understanding of the factors that facilitate and the challenges that hinder and ultimately prevent language teachers from integrating digital technology in their day-to-day practice. We propose conducting a comparative study of pre- and post-pandemic use of digital technologies by language teachers and their attitude towards technologies, analyzing how the global lockdown affected the use of digital technologies and the development of digital competencies.

References

1. European Commission: Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and The Committee of the Regions. A Digital Agenda for Europe. (2010) https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0245:FIN:EN:PDF
2. Partnership for 21st Century Skills: P21's Framework for 21st Century Learning (2009). https://files.eric.ed.gov/fulltext/ED519462.pdf
3. European Commission: 2nd survey of schools: ICT in education. final report - Study (2019). https://ec.europa.eu/digital-single-market/en/news/2nd-survey-schools-ict-education
4. Redecker, C., Punie, Y.: European Framework for the Digital Competence of Educators: DigCompEdu (2017). https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/european-framework-digital-competence-educators-digcompedu
5. Ng, K.L.E., Olivier, W.P.: Computer assisted language learning: an investigation on some design and implementation issues. System **15**(1), 1–17 (1987)
6. Bax, S.: CALL—past, present and future. System **31**(1), 13–28 (2003)
7. Talmo, T., Fominykh, M., Giordano, A., Soule, M.V.: Digital searchlight – a study on digital skills being sought amongst language teachers. In: 14th International Technology, Education and Development Conference, Valencia, Spain, 2–4 March, pp. 4956–4965 (2020)
8. Talmo, T., et al.: Digital competences for language teachers: do employers seek the skills needed from language teachers today? In: Zaphiris, P., Ioannou, A. (eds.) HCII 2020. LNCS, vol. 12205, pp. 399–412. Springer, Cham (2020). https://doi.org/10.1007/978-3-030-50513-4_30
9. Fominykh, M., et al.: Digital competences in language education: teachers' perspectives, employers' expectations, and policy reflections (2019). https://www.dc4lt.eu/
10. Albirini, A.: Teachers' attitudes toward information and communication technologies: the case of Syrian EFL teachers. Comput. Educ. **47**(4), 373–398 (2006)
11. Lam, Y.: Technophilia vs. technophobia: a preliminary look at why second-language teachers do or do not use technology in their classrooms. Can. Modern Lang. Rev. **56**(3), 389–420 (2000). https://doi.org/10.3138/cmlr.56.3.389
12. Soulé, M.V., Papadima-Sophocleous, S.: Exploring the influence of teachers' education and professional development in Cypriot higher education CALL practices. In: Giannikas, C.N., Kakoulli Constantinou, E., Papadima-Sophocleous, S. (eds.) Professional development in CALL: a selection of papers, pp. 25–37 (2019)
13. Sullivan, N.B., Bhattacharya, K.: Twenty years of technology integration and foreign language teaching: a phenomenological reflective interview study. Qualitative Report **22**(3), 757–778 (2017)
14. Webster, L., Murphy, D.: Enhancing learning through technology: challenges and responses. In: Enhancing Learning Through Technology, pp. 1–16 (2008)
15. Warschauer, M., Healey, D.: Computers and language learning: an overview. Lang. Teach. **31**(2), 57–71 (1998)
16. Siemens, G.: Connectivism: a theory for the digital age. Int. J. Instr. Technol. Distance Learn. **2**(1) (2005). http://www.itdl.org/Journal/Jan_05/article01.htm

17. Perifanou, M., Economides, A.: MOOCs for language learning: an effort to explore and evaluate the first practices. In: 8th International Technology, Education and Development Conference, Valencia, Spain, 10–12 March, pp. 3561–3570 (2014)
18. Hwang, G.-J., Hsu, T.-C., Lai, C.-L., Hsueh, C.-J.: Interaction of problem-based gaming and learning anxiety in language students' English listening performance and progressive behavioral patterns. Comput. Educ. **106**, 26–42 (2017)
19. Perifanou, M., Mikros, G.: "Italswebquest": a wiki as a platform of collaborative blended language learning and a course management system. Int. J.Knowl. Learning **5**(3–4), 273–288 (2009)
20. Godwin-Jones, R.: Augmented reality and language learning: from annotated vocabulary to place-based mobile games. Lang. Learn. Technol. **20**(3), 9–19 (2016)
21. Hwang, G.-J., Chiu, L.-Y., Chen, C.-H.: A contextual game-based learning approach to improving students' inquiry-based learning performance in social studies courses. Comput. Educ. **81**, 13–25 (2015)
22. Burston, J.: MALL: the pedagogical challenges. Comput. Assist. Lang. Learn. **27**(4), 344–357 (2014)
23. Dalton, G., Devitt, A.: Irish in a 3D world: engaging primary school children. Lang. Learn. Technol. **20**(1), 21–33 (2016)
24. Canals, L.: The effects of virtual exchanges on oral skills and motivation. Lang. Learn. Technol. **24**(3), 103–119 (2020)
25. Sysoyev, P.V., Evstigneeva, I.A., Evstigneev, M.N.: The development of students' discourse skills via modern information and communication technologies. Procedia. Soc. Behav. Sci. **200**, 114–121 (2015)
26. Rodríguez, B.R., Gómez Zermeño, M.G.: Digital competences in English language teaching and learning at high. Campus Virtuales **6**(2), 51–59 (2017)
27. Hampel, R., Stickler, U.: New skills for new classrooms: training tutors to teach languages online. Comput. Assist. Lang. Learn. **18**(4), 311–326 (2005)
28. Cadorath, J., Harris, S., Encinas, F.: Training for distance teaching through distance learning. Open Learn. J. Open, Distance e-Learning **17**(2), 139–152 (2002)
29. Compton, L.K.L.: Preparing language teachers to teach language online: a look at skills, roles, and responsibilities. Comput. Assist. Lang. Learn. **22**(1), 73–99 (2009)
30. White, C., Murphy, L., Shelley, M., Baumann, U.: Towards an understanding of attributes and expertise in distance language teaching: tutor maxims. In: Evans, T., Smith, P., Stacey, E. (eds.) Research in Distance Education (RIDE), vol. 6, pp. 83–97. Deakin University, Geelong (2005)
31. Shelley, M., White, C., Baumann, U., Murphy, L.: "It's a unique role!" Perspectives on tutor attributes and expertise in distance language teaching. Int. Rev. Res. Open Dist. Learn. **7**(2), 1–15 (2006)
32. Røkenes, F.M., Krumsvik, R.J.: Prepared to teach ESL with ICT? A study of digital competence in Norwegian teacher education. Comput. Educ. **97**, 1–20 (2016)
33. Oksana, B.K., Olha, V.P.: Future english language teachers' digital competence development by means of storyjumper software tool. Inf. Technol. Learn. Tools **79**(5), 126–138 (2020)
34. Zhao, Y., Pugh, K., Sheldon, S., Byers, J.L.: Conditions for classroom technology innovations. Teach. Coll. Rec. **104**(3), 482–515 (2002)
35. Ferrari, A.: Digital competence in practice: an analysis of frameworks. Joint Research Centre, European Commission, Luxembourg, Report EUR 25351 EN (2012). https://ec.europa.eu/digital-single-market/en/news/digital-competence-practice-analysis-frameworks
36. Murphy, L.M., Shelley, M.A., White, C.J., Baumann, U.: Tutor and student perceptions of what makes an effective distance language teacher. Distance Educ. **32**(3), 397–419 (2011)

37. Raman, K., Yamat, H.: Barriers teachers face in integrating ICT during English lessons: a case study. Malays. Online J. Educ. Technol. **2**, 11–19 (2014)
38. Lin, C.-Y., Huang, C.-K., Chen, C.-H.: Barriers to the adoption of ICT in teaching Chinese as a foreign language in US universities. ReCALL **26**(1), 100–116 (2014)
39. Son, J.-B., Windeatt, S. (eds.): Language Teacher Education and Technology: Approaches and Practices. Bloomsbury Academic, London (2017)
40. Davies, G.: Perspectives on Offline and Online Training Initiatives. In: Felix, U. (ed.) Language learning online: Towards best practice, pp. 193–214. Swets & Zeitlinger, Lisse (2003)
41. Rickard, A., Blin, F., Appel, C.: Training for trainers: challenges, outcomes, and principles of in-service training across the Irish education system. In: Hubbard, P., Levy, M. (eds.) Teacher education in CALL. pp. 203–218. John Benjamins, Philadelphia, PA (2006)
42. van Olphen, M.: Digital portfolios: Balancing the academic and professional needs of world language teacher candidates. In: Kassen, M.A., Lavine, R.Z., Murphy-Judy, K., Peters, M. (eds.) Preparing and developing technology-proficient L2 teachers. pp. 265–294. CALICO, San Marcos, TX (2007)
43. Hubbard, P., Levy, M.: The scope of CALL education. In: Hubbard, P., Levy, M. (eds.) Teacher Education in CALL. John Benjamins (2006)
44. Reinders, H.: Teaching (with) technology: the scope and practice of teacher education for technology. Prospect **24**(3), 15–23 (2009)
45. Hong, K.H.: CALL teacher education as an impetus for L2 teachers in integrating technology. ReCALL **22**(1), 53–69 (2010)
46. Ertmer, P.A., Ottenbreit-Leftwich, A.T.: Teacher technology change. J. Res. Technol. Educ. **42**(3), 255–284 (2010)
47. Guichon, N.: Training future language teachers to develop online tutors' competence through reflective analysis. ReCALL **21**(2), 166–185 (2009)
48. Kessler, G.: Assessing CALL teacher training: what are we doing and what could we do better? In: Hubbard, P., Levy, M. (eds.) Teacher education in CALL. pp. 23–43. John Benjamins (2006)