Preparing pre-service primary teachers to facilitate students' key competences for lifelong learning

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This research examined pre-service teachers' opinions on developing primary school students' key competences for lifelong learning. We adopted a phenomenological design with a study group comprising 27 pre-service teachers purposively sampled using a maximum variation and criterion method. Descriptive and content analyses were used to analyse data. Results showed that pre-service teachers had basic knowledge about lifelong learning and found key competences essential and relevant for primary school students. The highest number of participants reported feeling efficient in developing social and civic competences, while the least number of participants reported feeling efficient in developing a sense of initiative and entrepreneurship, and digital competences. Pre-service teachers indicated additional training needs, particularly in these competence areas. Pre-service teachers' criticism of teacher training programs showed a specific focus on insufficient practice. Accordingly, some changes in initial teacher education are suggested for improving pre-service teachers' competences to facilitate key competence development.

Introduction

The 21st century is characterised and depicted by great changes in everyday life. Globalisation, economic changes, longer life expectancy, demographic change and rapid progress in information and communication technologies, as well as sudden shocks such as the Covid-19 pandemic have reconstructed how people live, work and learn, which resulted in increased importance for the concept of lifelong learning (OECD, 2021; Voogt & Roblin, 2012). Individuals need to attain new and more relevant competences within a lifelong learning perspective that has become more necessary and crucial than ever before (European Commission, 2018). Demands of the new labour market have required a relating of the efficiency of school education to the skills of individuals in the society, that has called for a competence-based approach to education (Dobryakova et al., 2023). There is now an increased focus on key competences that are considered vital for a lifetime (Eurydice, 2002).

The 2006 European reference framework of key competences for lifelong learning put forth eight key competences necessary for personal fulfilment and development, active citizenship, social inclusion and employment. Those key competences are:

- communication in the mother tongue
- communication in foreign languages
- mathematical competence and basic competences in science and technology
- digital competence
- learning to learn
- social and civic competences

- sense of initiative and entrepreneurship
- cultural awareness and expression

The European Parliament and The Council of the European Union have suggested that all member states include citizens having key competences as part of their lifelong learning strategies. It is required to ensure that initial education and training help youth develop the key competences to an adequate level that prepares them for adult life, and which forms a basis for professional life and lifelong learning (European Communities, 2007; European Union, 2006).

The goal of developing key competences defines fundamental responsibilities for governments, education systems and schools. As schools are unique places for equipping youth with those competences, governments strive to accurately define and conceptualise the set of skills and competences to integrate them into the educational standards that all students are expected to reach by the end of compulsory schooling (Ananiadou & Claro, 2009). In Turkey, key competences were included in the scope of compulsory education with the draft curricula prepared in 2017 based on the European reference framework of key competences. Changes in compulsory schooling require changes in teacher education as well since the understanding and capacity of teachers play a crucial role in developing key competences. In this respect, it is necessary to include these basic competences in the teacher education system. The initial teacher education and continuing training should equip teachers with the necessary skills and capability to facilitate the students' acquisition of key competences (Gordon et al. 2009). Herein, enhancing teacher education quality has become a priority for the EU to have an explicit impact on students' acquisition of competences. Teachers' professional development and training are considered a main requirement for the way forward (Riviou & Sotiriou, 2013).

In line with the policy developments and reforms, researchers have also contributed to facilitating the development of key competences for lifelong learning. Some focused on the analysis of school curriculum based on key competences (Dąbrowski & Wiśniewski, 2011; Koç & Erdem, 2016; Yüksel, 2019), assessment of key competences across the curriculum (Calvani et al., 2009; Pepper, 2011) and integrating key competences (Lleixà et al., 2016). Some studies also focused on an instrument development for assessing preservice teachers' understanding and views about the role of key competencies in education (Wilson-Daily et al., 2023), needs analysis to build teachers' capacity for competence oriented education (Riviou & Sotiriou, 2013), teaching competences necessary for developing key competences (De-Juanas et al., 2016) and pre-service teachers' competencies in accordance with key competences (Jovanova-Mitkovska & Hristovska, 2011), and pre-service and in-service teacher education within the framework of key competences (Gordon et al., 2009).

Related research in Turkey determines to what extent pre-service teachers (Evin Gencel, 2013, Karakuyu, 2023; Özgür, 2016; Şahin et al., 2020) and in-service teachers (Çilek et al., 2023; Şahin & Arcagök, 2014; Uzunboylu & Hürsen, 2011) possess key competences. Arsal (2015) investigated teacher competences framework based on key competences. It can be asserted that research that relates key competences with teacher education focused

mainly on individuals' own level in terms of key competences for lifelong learning. However, studies with a focus on enhancing teachers' capacity for competence development are relatively limited. Further research is deemed necessary to explore the influence of teacher training before aiming to bring competences into classrooms (Ahmadi & Besançon, 2017; Valtonen et al., 2021). It is necessary to investigate the current situation and role of teacher education programs for enhancing pre-service teachers' understanding and beliefs on facilitating key competence development in primary education. Within this framework, the main aim of this current research is to examine pre-service teachers' opinions on developing primary school students' key competences for lifelong learning.

Method

Our research is based on a phenomenological design. Phenomenological studies describe the meaning of experiences related to a concept or phenomenon for individuals. They focus on the common aspects of the experiences of all participants regarding a phenomenon (Creswell, 2007; pp. 57-62). In our study, developing key competences for lifelong learning was regarded as the phenomenon. In primary schools, key competences are expected to be developed and pre-service teachers are supposed to integrate these competences in their courses. Based on the experiences of pre-service teachers, we aimed to investigate how they conceptualise key competences and the process of competence development.

Study group

The study group comprised 27 pre-service teachers, obtained by a purposive sampling method based on maximum variation and criterion sampling. At least 4 pre-service teachers from each department were included in the study group. As the criterion, only senior pre-service teachers were included in the study. Table 1 presents participant demographics.

Data collection tools

Before data collection, the ethics committee approval was obtained from Gazi University. Data were collected using a semi-structured interview form based on related literature (Appendix). In this process, efforts were made to make the questions clear and easily understandable (Karasar, 2012). The questions were objective to help the participants express themselves without worrying about the interviewer's approval and they were focused without asking about more than one subject (Patton, 2014).

Draft interview forms were submitted to three experts from the field of curriculum development, and two experts from the field of measurement and evaluation. Two questions were revised in line with the expert opinions since they were considered similar and their answers might be repetitive. For piloting, the interview forms were applied to two pre-service teachers who were not participants in the study. There was no need for revision as a result of this process. Accordingly, in the final interview forms, there were a

total of 8 questions. Data were collected between March and June 2018 and the interview questions were directed to participants in Turkish; however, within the scope of this study, they were translated into English by the researchers and presented in the Appendix section. While collecting data, participants were informed about the goal of the study and interviews were performed face-to face with the voluntary participants.

Table 1: Participant demographics

Code	Gender	Department	Code	Gender	Department
A_1	F	CEIT	A_{15}	M	PE
A_2	F	FAE	A_{16}	F	PE
A_3	F	TSSE	A_{17}	F	PE
A_4	F	TSSE	A_{18}	F	CEIT
A_5	F	TSSE	A_{19}	F	CEIT
A_6	F	FLE	A_{20}	F	FAE
A_7	F	MSE	A_{21}	M	FAE
A_8	M	FLE	A_{22}	F	FAE
A_9	F	MSE	A_{23}	F	TSSE
A_{10}	F	MSE	A_{24}	F	MSE
A_{11}	F	FLE	A_{25}	F	CEIT
A_{12}	M	FLE	A_{26}	F	CEIT
A_{13}	F	PE	A_{27}	M	MSE
A_{14}	F	PE			

Key to Departments: Computer and Instructional Technologies Education (CEIT); Fine Arts Education (FAE); Mathematics and Science Education (MSE); Primary Education (PE); Foreign Languages Education (FLE); Turkish and Social Sciences Education (TSSE)

Data analysis

Descriptive analysis was used for data that did not require in-depth analysis, whilst content analysis was used to examine the obtained data more closely and to reach the concepts and themes that explain this data (Yıldırım & Şimşek, 2011). For descriptive analysis, a framework was created based on the interview questions. Data were read and organised considering under which theme the data would be presented in line with the framework defined for each question. For content analysis, on the other hand, the data obtained through interviews were transcribed by the researcher. The transcribed data were analysed and coded by the researchers independently, and draft sub-themes and themes were determined. Then, the draft themes were compared and finalised by the researchers. Direct quotations were determined and visuals were prepared according to the codes and themes.

There were precautions taken by the researchers to establish validity and reliability. In this respect, by making appointments with the participants, interviews were done on the day and time they wanted. Thus, it was aimed to keep the interview time longer and to increase credibility. For credibility, it was also aimed to obtain in-depth data on the subject. Since the same type of questions can cause problems in providing in-depth and detailed data, which was crucial for qualitative research, different types of questions,

including open and closed-ended questions, were asked to address different thinking styles of the participants. The data collection and analysis processes were reported in detail for transferability. The purposive sampling was also used to include the data sources that might reflect the diversity. For dependability, researchers coded data independently, and the consistency between the codes was compared (Yıldırım & Şimşek, 2011).

Findings

Opinions on the concept of lifelong learning

Pre-service teachers' opinions on the concept of lifelong learning were grouped under three sub-themes: qualities related to learning, lifelong learning competences and qualities related to the individuals.

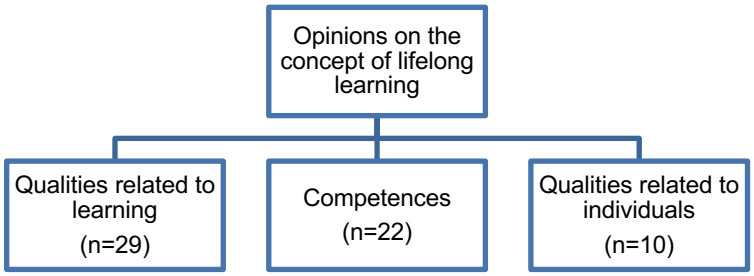

Figure 1: Opinions on the concept of lifelong learning

Within this scope, pre-service teachers described learning as a process without limitations in terms of time, place and subject by using expressions such as "developing oneself in every sense" and "integrating learning into one's life". It was found that the most frequently mentioned competence related to lifelong learning was self-improvement, while the most frequently underlined individual qualities were individuals' eagerness to learn and need for knowledge. Some distinctive quotations in this context are illustrated below.

A_1. … motivation for learning. If there is the motivation for learning, individuals develop, improve and move forward in the areas they need throughout life, both while receiving formal education and after completing it. Within their hobbies, they can create videos, websites, blogs, etc. on different platforms. They can improve themselves using these platforms.

A_{23}. To improve us in every sense. It is not over when we graduate from university or finish high school. I think with lifelong learning we improve ourselves in every sense, not limited to our field of study.

Opinions on the importance of key competence

Pre-service teachers' opinions on the importance of key competences in primary education were examined based on their scores from 1 to 10. The mean scores were calculated and presented in Figure 2.

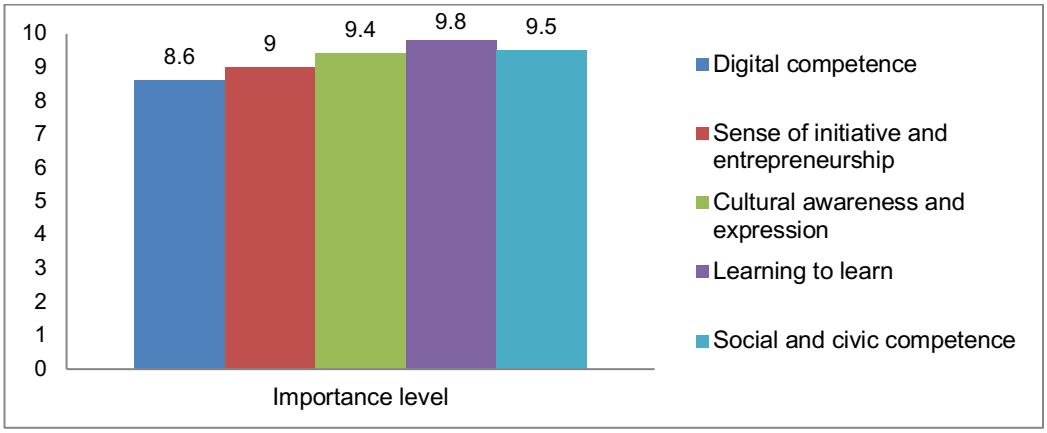

Figure 2: Opinions on the importance of key competences

Figure 2 shows that the mean score for each competence area was quite high. According to the participants, the most important key competence area that should be developed in primary education was learning to learn, whereas digital competence was the least important competence area compared to the others. The reason behind this was summarised by a pre-service teacher:

> A_7. Digitalisation is everywhere right now, so I don't even think there is a need for teaching digital competences right now because even infants have tablets and computers. They are already learning while they grow up. Still, they can be improved.

Opinions on developing key competences

Pre-service teachers' opinions on how to develop key competences were grouped under four sub-themes. The sub-themes are presented in Figure 3.

Findings showed that most pre-service teachers suggested that all five key competences should be integrated with the current courses in primary education. Opinions of some pre-service teachers are as follows:

> A_{11}. Definitely, competences should be taught in an integrated way. It becomes meaningless if they are taught as an independent course. If it is taught in an integrated way, children actually attain these competences before they realise they are being taught.

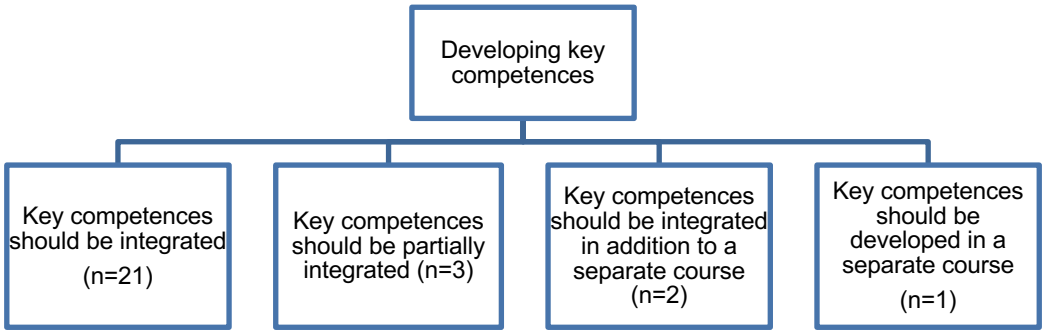

Figure 3: Opinions on how to develop key competences

Three pre-service teachers argued that while some key competences should be integrated with current courses, sense of initiative and entrepreneurship, digital competences and social and civic competences should be taught in individual courses instead of incorporating them in the current courses. Two pre-service teachers suggested that it was necessary to develop key competences in a particular course in addition to integrating them into current courses to make the competences more overt. One pre-service teacher, on the other hand, believed that key competences should be developed as a completely independent course, arguing that:

> A_{18}. It should be an independent course. Because, for instance, when these competences are integrated into Turkish, they disappear. You do not focus on it. Instead, I think you should choose one, and you should only teach it.

Opinions on the relevance of key competences

Pre-service teachers' opinions on the relevance of key competences considering different courses were examined based on the scores from 1 to 10. Figure 4 shows the mean score for each competence area.

Figure 4 indicates that the most relevant key competence areas to be integrated into pre-service teachers' field of study were learning to learn and a sense of initiative and entrepreneurship, while the least relevant area was found to be cultural awareness and expression. One pre-service teacher whose department was maths argued that:

> A_{24}. It is difficult to integrate cultural awareness and expression. Sometimes I see it on YouTube, some trigonometric formulas are taught with visual arts or music. … In terms of implementation, it can enhance students' desire to learn maths.

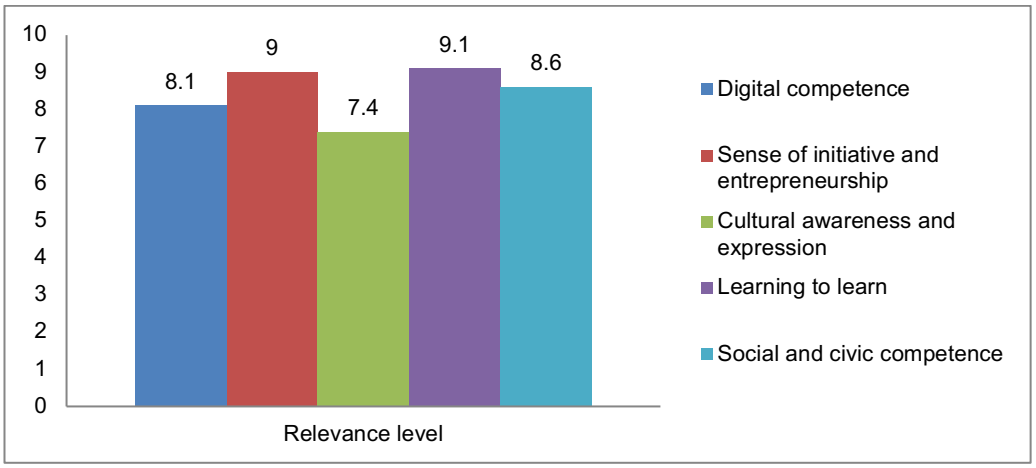

Figure 4: Opinions on the relevance of key competences

Efficacy beliefs for developing key competences

Pre-service teachers' efficacy beliefs for developing key competences were coded as efficient, partially efficient and inefficient as illustrated in Figure 5.

Competences/ Efficacy level	Efficient	Partially efficient	Inefficient	Not defined
Sense of initiative and entrepreneurship	10	7	7	3
Learning to learn	13	6	4	4
Cultural awareness and expression	12	6	5	4
Social and civic competence	14	9	1	3
Digital competence	10	7	7	3

Figure 5: Efficacy beliefs for developing key competences

Findings showed that the highest number of participants felt efficient in developing social and civic competences, while the least number of participants felt efficient in developing a sense of initiative and entrepreneurship and digital competences. A23 explained this situation:

A_{23}. Considering digital competences, there are smart boards in class. Since I don't know right now, I need training on this. I would like to evaluate myself after I receive training. During the internship, the students used it because they were much more knowledgeable than us. To be honest, I find myself inefficient in this regard.

Findings also revealed that pre-service teachers emphasised the role of some additional factors related to developing key competences. Individual characteristics of students, society and families were among those factors that also played significant roles in this process.

A_{14}. What can be the level of our influence as teachers? Although we promote tolerance, the attitude of the family may be dominant.

A_{26}. It is very important for the student to be actually ready… I can organise appropriate activities for those who are interested.

Pre-service teachers' opinions on developing each key competence were grouped under two themes: competences and activities. The sub-themes are presented and described under each key competence.

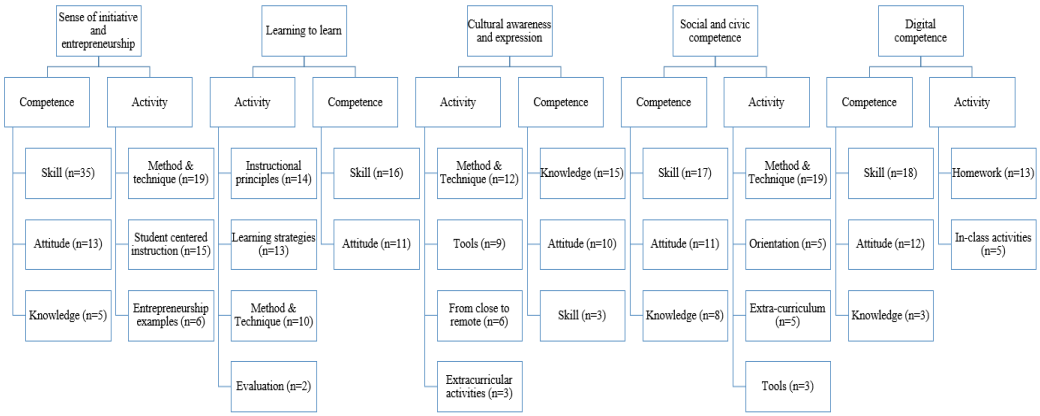

Figure 6: Opinions on developing key competences
(use 'zoom in' function on web or PDF reader to view)

Regarding pre-service teachers' opinions on developing a sense of initiative and entrepreneurship, the theme of competences included sub-themes of skills, attitudes and knowledge. The most frequently emphasised skills were expressing thoughts, creative thinking, leadership, risk-taking, decision-making and cooperation. Developing the entrepreneurial spirit in students, and increasing self-confidence, courage and motivation were the main attitudes that pre-service teachers believed they could develop. Additionally, the importance of entrepreneurship and decision-making was the prominent theoretical knowledge the pre-service teachers considered essential for supporting a sense of initiative and entrepreneurship. Sample expressions are illustrated below:

A_{16}. I think it's up to us to make them a little more active. We can achieve this by giving them opportunities to speak or giving constructive feedback for their errors, helping them overcome the fear of speaking up. I think we can create a positive classroom environment.

A_{23}. Students already have high qualities; what I need to do is not limit this capacity. I think they will naturally improve. Creativity and entrepreneurship should be free in the class. I will not impose my own thoughts and ideas on the child.

Methods and techniques to be used in the classroom, student-centred instruction, and entrepreneurship examples were the sub-themes under the activities theme to develop relevant knowledge, skills and attitudes. Projects, group studies, collaborative activities and individual studies were among the methods and techniques most frequently mentioned to improve a sense of initiative and entrepreneurship.

A_{27}. I think the best thing in this regard can be using projects. But this should not be used like "You do your homework, I will review it and give it back to you". It should rather give students a situation where they can explain their views in front of other students and feel beneficial to society.

Furthermore, it was also asserted that some real-life examples of entrepreneurship would also improve the development of the related competence. A pre-service teacher asserted that:

A_{25}. Even if I'm not an entrepreneur, I can give them examples from entrepreneurs. I can show children what those entrepreneurial people have lived throughout their lives. I can show where they came from. This way, I can show that there is nothing impossible; this way, maybe I can instil it, especially for those with an entrepreneurial spirit.

Opinions on developing learning to learn

Regarding pre-service teachers' opinions on developing learning to learn, the theme of activities fell into the sub-themes of teaching principles, learning strategies, methods and techniques and evaluation. Accordingly, pre-service teachers stated that they could plan the teaching process based on general teaching principles, individual differences of students, learning styles, study habits and previous knowledge of students. Furthermore, pre-service teachers stated that they could teach learning strategies, help students think about their own learning processes, and use inventories in order to discover and develop students' learning strategies. The methods and techniques frequently mentioned by the pre-service teachers were discussion, group work and research assignments. There were also opinions underlining the benefit of self and peer assessment for enhancing learning to learn competence. One pre-service teacher asserted:

> A_3. We can ask students to write their limitations in learning, the situations in which they feel good, and how they have learned a subject better. (…) I think our main task here should be to teach techniques. If the child learns techniques, s/he can explore how s/he learns.

Pre-service teachers' views on learning to learn competence were grouped under the sub-themes of skills and attitudes. In this context, the most frequently emphasised skills were time management, research skills, and creativity. The attitudes included motivation to learn and a sense of curiosity. Regarding time management, a pre-service teacher argued:

> A_{23}. We can make a timeline with the children. What did I spend the most time on during the day? … I could ask students to write down what they did for how many hours. I can help them question why they spend so much time. … I may ask some questions such as "You studied hard for the exam, but you failed. Have you ever thought about why? "Why did you have a low grade? What was the reason behind this grade? Did you work on the whole subject at once or break it into pieces? Or did you study by listening to music or watching TV?" I can make them question.

Opinions on developing cultural awareness and expression

Regarding pre-service teachers' opinions on developing cultural awareness and expression, the activities theme was grouped under sub-themes of method and technique, tools, examples and extracurricular activities. In this context, the most frequently underlined activities included using research assignments and the drama method, written materials, mainly textbooks, local clothing, etc. They stated that using real objects or videos could help students improve their cultural awareness and expression competences. One sample expression is:

> A_{11}. The textbook has an effect on this competence. The school chooses the book. If it includes American, and British people, while excluding African or Indian people, I can try to use extra videos or other activities to raise cultural awareness. (…) For example, when choosing a photo, it should be from different countries, not only in terms of culture but also whether it is a thin person, an overweight person or a photo of a child in a wheelchair. I will pay attention to such differences.

The theme of competences was analysed under the sub-themes of knowledge, attitude and skills. Accordingly, it was stated that basic cultural elements, branches of art and cultural differences should be taught. In addition, it was deemed necessary to encourage respect, increase students' interest in art, and improve their creativity, self-expression and hypothetical thinking skills. An important focus was on basic cultural knowledge, and a pre-service teacher exemplified how to teach this necessary knowledge:

A_{24}. I can ask students to search for the lives of scientists in mathematics, such as Farabi, İbni Sina, Harezmi, Ömer Hayyam, and make a short presentation. There are hundreds of scientists, and each student can take one.

Opinions on developing social and civic competences

Regarding pre-service teachers' opinions on developing social and civic competences, the theme of competences was discussed under the sub-themes of skills, attitudes and knowledge. According to the pre-service teachers, within the scope of social and civic competence, it was deemed necessary to equip students with a knowledge of social rules, foster a sense of responsibility and respect and improve the skills of communication and empathy. One sample expression is:

A_4. Developing empathy, respect, making them realise that sometimes my friend's opinion can be more logical... When I reflect on it, others' views seem to be more important. (…) social rules rules can also be taught.

There were four sub-themes under the activities theme: method-technique, guidance, extracurricular activities and tools. It was found that collaborative activities and group work were the most frequently emphasised activities.

A_{11}. Indeed, activities mean a lot. The child definitely reflects outside what s/he does in the classroom. When he talks to his friend in class, he does not hesitate to talk to someone else outside. (…) pair work, group work, and projects are vital in this sense.

Opinions on developing digital competence

Regarding pre-service teachers' opinions on developing digital competence, the competences were discussed in the sub-themes of skills, attitudes and knowledge. Accordingly, the pre-service teachers indicated the need for developing students' research skills, basic computer skills, and their ability to question the accuracy of the information they find. Increasing student motivation to use information and communication technologies, raising awareness about the harms of technology, and increasing awareness in terms of ethical principles were among the attitudes that were considered necessary. Additionally, some participants stated that giving students information about reliable sources was crucial for using information and communication technologies effectively. One notable expression is illustrated as follows:

A_6. I would give students a project assignment for which students need to use the Internet. It is a project that requires research and technology. I can support them about how to search from which sites, which sites would be more appropriate to visit, how to distinguish between sites, which files they can find, and how they can reach the things they want. Is the information correct, how will they understand it, and have they found the correct website? … technology has not only benefits but also harms, I can teach these.

Within the scope of activities deemed necessary for the development of digital competences, there were sub-themes of homework and in-class activities. In this context, pre-service teachers stated that they could improve students' competences by giving research assignments and ensuring that the assignments were done using different resources. Furthermore, it was stated that possible unethical behaviours could be prevented with the support of families and teachers' request for a bibliography for assignments or projects. On the other hand, it was also stated that using games and programs in the classroom might also contribute. A notable statement is given below:

A_{23}. We can play a game on the phone at the end of the course since children have Internet and phones. A group is formed in the game, and everyone becomes a member. I ask questions, and the children answer the questions on the phone. I can evaluate digitally instead of saying it directly; it will be better if there is an award at the end. They are also playing against time.

Opinions on training needs

Pre-service teachers' opinions regarding whether they had training needs in terms of facilitating key competence development were based on a descriptive analysis (Figure 7).

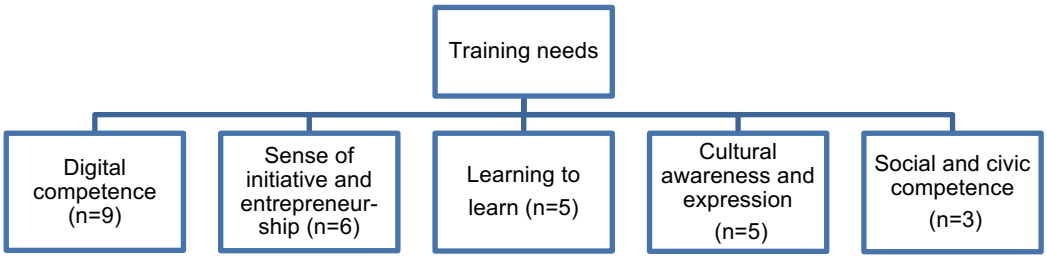

Figure 7: Training needs for developing key competences

Regarding training needs, it was found that only two pre-service teachers stated that they did not need additional information on any subject. The areas that pre-service teachers needed training showed that they needed additional information in all areas, particularly in developing a sense of initiative and entrepreneurship and digital competences. Some notable statements in this context are:

A_5. Frankly, I may need to learn more technical information regarding digital competence.

A_{27}. I need information about how to help students carry out projects for entrepreneurship.

Opinions on teacher training programs

Pre-service teachers' opinions and suggestions for teacher training programs resulted in five sub-themes shown in Figure 8.

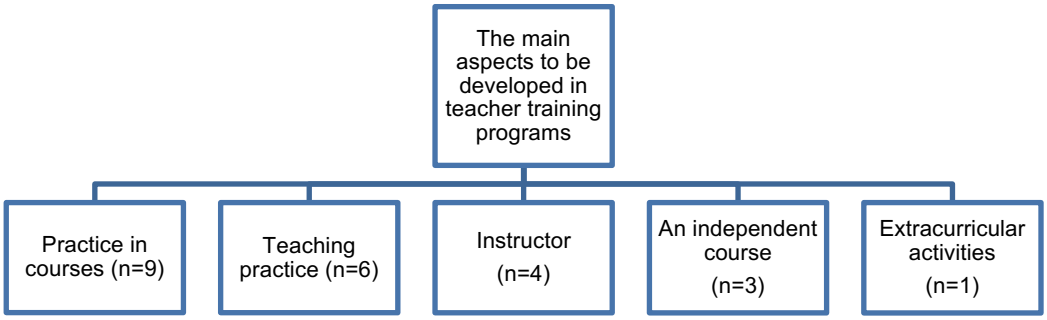

Figure 8: Opinions on teacher training programs

Findings showed that some pre-service teachers criticised the insufficiency of practice in the current program. They focused on the enhancement of practice rather than the theoretical knowledge, as in the following sample expression:

> A_3. In general, our courses were theoretical, except for the teaching practice. I think they should be put into practice more. If these are to be discussed in undergraduate education, for example, we should learn the techniques and how digital competences should be taught to students.

Some pre-service teachers underlined the role of teaching practicum, arguing that the practicum was limited in quantity and quality. A sample statement is:

> A_6. I think two semesters were not sufficient for the teaching practice. I don't think the teaching practice will be enough to develop 21st century skills, but it would be helpful if we had four years of experience. A real classroom environment. Rather than theory, if the practice could be done during all four years, we could gain experience.

Some participants, criticising the quality of theoretical courses, underlined that the behaviour of the instructors was also crucial in developing competences. In this context, A24 emphasised the importance of being a role model:

> A_{24}. Instructors train teachers, but they do not behave like teachers. In the education faculty, instructors should be role models … Instructors may have the necessary knowledge, but they do not implement it in the classroom.

Some participants pointed out that current courses did not focus on key competences and emphasised that an independent course in teacher training programs could also contribute to their pedagogical capacities to develop key competences for lifelong learning competencies at the primary education level. One pre-service teacher argued that:

A_5. We do not focus on the development of competences in our courses. What should I do about these competences when I go to the classroom? There could be additional courses about this.

Discussion and conclusion

Developing key competences for lifelong learning

Opinions on the lifelong learning concept revealed that pre-service teachers defined the learning process within the scope of lifelong learning as a process with no limitations regarding time, place and subject. This result is in line with previous research (Deveci & Bedirhanoğlu, 2022; Sezen-Gültekin & Erdoğan, 2019) indicating university students' conceptualisation of lifelong learning with the attributes of "continuity", "limitlessness", and "expansion of horizons". On the other hand, it was worthy of note that the social and economic contributions of lifelong learning were not mentioned. In this respect, it could be asserted that the pre-service teachers had a limited level of knowledge about the concept of lifelong learning.

Landberg and Partsch (2023) examined how teachers defined lifelong learning and similarly found that only some of the participants focused on the intentionality of lifelong learning. Researchers suggested including lifelong learning as an explicit content in teacher training in order to help both teachers and headmasters conceptualise it as an intentional process. Equipping pre-service teachers with a wider perspective by increasing their knowledge and awareness in lifelong learning could contribute positively to their practices for integrating key competences with classroom activities. In a study conducted by UNESCO (2016), interviews with teachers and school administrators in Australia revealed participants felt sufficient to support the teaching of transversal competencies because they understood these competences well.

Regarding opinions on the importance and relevance of key competences for students in primary education, it can be concluded that pre-service teachers did not have a negative opinion or prejudice that might affect their practices regarding key competence development in the primary education level. These findings are in line with the results of previous studies (Karakoyun & Lindberg, 2020; King, 2012; UNESCO, 2016) revealing teachers and pre-service teachers' beliefs on the significance of 21st century skills for both their future students and their own careers.

Pre-service teachers' efficacy beliefs on developing key competences for lifelong learning

The opinions of pre-service teachers on their efficacy levels regarding developing key competences showed that the highest number of participants felt efficient in developing social and civic competences. In contrast, the least number of participants felt efficient in developing a sense of initiative and entrepreneurship and digital competences. Parallel to this, when the areas that pre-service teachers needed training were examined, it was concluded that pre-service teachers needed additional information in all areas, particularly in a sense of initiative and entrepreneurship and digital competences.

These findings are similar to those of previous research that revealed shortcomings and problems in the pedagogy for 21st century skills. In the UNESCO (2016) study examining teachers' efficacy beliefs about integrating cross-competencies, it was determined that most teachers in the six countries where data were obtained within the scope of the study, namely Australia, India, Republic of Korea, Mongolia, Thailand and Vietnam, had a moderate level of efficacy belief in supporting the teaching of competences. Investigating the beliefs and perceptions of pre-service teachers regarding 21st century skills, Bedir (2019) determined that pre-service teachers needed improvement in teaching 21st century skills. Pre-service teachers stated that instructional standards for the teaching of 21st century skills were not included in the curricula. Similarly, in the report of Walden University, teachers who graduated from pre-service teacher training programs since 2000 stated that the program they graduated from did not train them well in teaching 21st century skills and effectively integrating technology into the teaching process (Grunwald Associates, 2010). Similarly, Manik, Qasim and Shareef (2014) revealed that pre-service teachers had difficulty integrating information and communication technologies into the teaching process. As a parallel result, Valtonen et al. (2021), who focused on pre-service teachers' perceptions of three areas related to 21st-century skills, including learning skills, collaboration dispositions, and skills to use ICT technology, revealed that participants were more confident in areas related to pedagogy than areas related to technology.

Overall, findings suggest that pre-service teachers should be supported with sound background knowledge on developing key competences. Considering that teachers' efficacy beliefs increase during the teacher education process and tend to decrease until the end of the first year of employment (Hoy, 2000; Tschannen-Moran et al., 1998), it is likely that the efficacy beliefs of pre-service teachers in this context will decrease further. For this reason, it may be beneficial to make arrangements in teacher training programs that will enhance pre-service teachers' beliefs on how to integrate key competences into the curriculum.

Opinions on teacher training programs

Findings indicated that effectively preparing pre-service teachers for developing key competences was considered related to practice in teacher training programs. For this reason, pre-service teachers suggested increasing the number of courses for practice via official regulations. With class-level regulations, on the other hand, increasing the quality

of current practice courses was suggested. The teaching practice course was one of the courses that needed improvement. The time allocated to the teaching practice was considered insufficient, and the current practices were not carried out with the required care and therefore did not contribute to the development of the pre-service teachers at the desired level.

Research on lifelong learning skills in education shows that initial training does not effectively prepare pre-service teachers in terms of how to teach skills (Crosta et al., 2023; Loução & Pedro 2023). In previous studies that focused on teacher training programs within the scope of developing lifelong learning competences, the importance of practice and the role of teaching practice was also underlined. Kayange and Msiska (2016) also determined that the teacher training program was too theoretical, and the teaching practice was inadequate to prepare pre-service teachers for 21st century education. Similarly, in the study by UNESCO (2016), in six of the seven countries for which data were obtained, teaching practicum was regarded as the most crucial factor in pre-service education in terms of improving the capacity of teachers to facilitate competence development.

The quality of theoretical courses in teacher training programs was another critical issue. In this context, it was considered necessary for the instructors to create a learning environment that might contribute to developing key competences with the arrangements they would make during their courses without any official regulation. As a natural consequence of this situation, instructors' qualities and their role as models were deemed essential. Some pre-service teachers argued that instructors needed to have these competences, to integrate key competencies into their courses as in primary education, to be a model for developing key competences, and thus to support the development of pre-service teachers in in-class and out-of-class activities.

On the other hand, some pre-service teachers believed that the contribution of the learning environment created by the instructors as role model would have only an indirect influence on pre-service teachers' knowledge and skills necessary for key competence development. They suggested adding an independent course on key competences to teacher training programs. It was emphasised that pre-service teachers needed support in establishing meaningful connections between the learning environment they experienced in the classroom, the teaching methods they learned, and how to develop key competences. Results of pre-service teachers' opinions on how to develop each key competence also confirm these results since the frequency of expressions obtained was low. This may be because of the difficulty of bridging the gap between what is known about pedagogy and key competences.

Previous studies also underlined this problem in teacher training. Emre-Akdoğan and Yazgan-Sağ (2019) found that pre-service teachers had difficulties in transforming their theoretical knowledge into practice in real classroom settings and regarded this as a continual issue in teacher education. Bedir (2019) revealed that according to pre-service teachers, academic subjects and pedagogical knowledge would not be sufficient to ensure the development of students in terms of skills such as critical thinking, problem-solving,

communication and cooperation. They stated they needed some courses to develop their professional competences for teaching these skills and to increase their knowledge in this context. Similarly, Gordon et al. (2009) stated that methods such as interdisciplinary, inter-curricular teaching, teamwork, individualised learning approaches and project-based teaching had been taught for some time in teaching education as a part of modern teaching; however, in most countries, these methods were not addressed as a part of key competence development. Overall, it could be concluded that the role of teacher training programs in developing key competences should be accepted. This should be reflected in the goals and learning outcomes in line with the requirements of the primary school curriculum within the scope of the lifelong learning framework.

This study was limited to five key competences, excluding communication in the mother tongue, communication in foreign languages, mathematical competence and basic competences in science and technology, because they do not result in different interpretations, whereas the five other key competences are transversal and interpreted in different ways among countries (Halász & Michel, 2011). Further studies could be performed to investigate the areas excluded. Based on the results of our study, enhancement can be performed in terms of theoretical courses and teaching practice, and experimental and longitudinal studies could be conducted to investigate the influence of those courses on pre-service teachers' capacities. Comparative studies can be done to examine different practices for key competence development. Furthermore, similar studies can be conducted with teachers to explore their in-class activities for facilitating key competence development in their classes. Finally, further research can explore the link between pre-service teachers or teachers' own key competences and their pedagogical competency to develop key competences of their students, as our study was limited to only the pedagogical aspect.

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Appendix: Interview questions

1. What comes to your mind when you think of "lifelong learning"?
2. How important is it that the key competences for lifelong learning are developed at the basic education level?
3. How do you think key competences can be developed at the basic education level?
4. How do you evaluate the appropriateness of teaching key competences in your lesson?
5. What are your thoughts about your level of competency regarding developing key competences? In this context, what kind of knowledge, skills and attitudes can you facilitate in your students?
6. When you evaluate your level of competency in general, do you think you need additional information in order to integrate key competences effectively into your lessons?
7. Considering your preparedness in integrating key competences of lifelong learning into your future courses, how would you evaluate the teacher training program you graduated from?
8. What are the qualifications that teacher training programs should have in order to develop your skills to develop primary school students' key competences? What are your suggestions?

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