

Silva Bratož
University of Primorska, Faculty of Education
Koper, Slovenija

UDC 316.644:371.12]:004
371.314.6

FUTURE PRIMARY SCHOOL TEACHERS' ATTITUDES TOWARDS USING ICT IN TEACHING

Abstract: Teachers' attitudes toward information communication technology (ICT) have a considerable impact on the efficient introduction of ICT in the education process. The primary aim of the study presented in this paper is therefore to identify the attitudes of pre-service primary school teachers toward ICT use in teaching and their opinions about the benefits and drawbacks of ICT use in primary education. In addition, the current researchers will look at the competences which education students associate with ICT use. For this purpose, a qualitative research study was carried out based on the analysis of students' personal documentary material in the form of argumentative essays. The results of the content analysis are presented in different categories and include selected direct quotations by the participants. The results indicate that future primary school teachers have favourable attitudes towards using information communication technology in teaching but are also well aware of the advantages and drawbacks related to different aspects of ICT use in primary school. The current researchers would like to argue that for an effective integration of ICT in teaching and learning, teacher training programmes need to provide future teachers with positive experiences and knowledge which will help them to make an efficient and sensible use of ICT in their teaching.

Keywords: information communication technology, ICT in education, pre-service teachers' attitudes, qualitative research.

INTRODUCTION

Information communication technology has been closely associated with innovation in education and innovative learning environments. The use of ICT in learning and teaching has often been seen as a pre-requisite for the development and introduction of new pedagogical practises and approaches. However, as pointed out by Fraillon, Ainley, Schulz and Friedman (2014), while several countries have made significant contributions in equipping schools with ICT, it is by no means clear what the real effect of these investments is. In addition, the common belief that students are familiar with using ICT is more an assumption than a conclusion derived from data.

Similarly to other countries, Slovenia has also published a number of strategic documents outlining the guidelines and policies for an efficient integration of ICT in education (Ministrstvo za izobraževanje, znanosti in šport, 2016; Bela knjiga, 2011; Kreuh, 2012; Kreuh and Bračko, 2011). It is clear from these documents that the skills and knowledge of using ICT in teaching represent one of the key competences in the area of education in the 21st century. The model of six basic e-competences proposed by Kreuh and Brečko (2011) integrates six main areas of ICT development, i. e. knowledge and critical use of ICT; the ability to function and communicate in virtual environments; the skills for searching, collecting, processing and critically evaluating data, information and concepts; a safe use of ICT, including the consideration of legal and ethical principles related to ICT use; developing, designing, updating and publishing products and materials; the ability to plan, deliver and evaluate teaching based on ICT.

The concept of digital competence as defined by Erstad, Kløvstad, Kristiansen, and Soby (in Røkenes and Krumsvik, 2014) encompasses “skills, knowledge, creativity, and attitudes that everybody needs in order to use digital media for learning and functioning in the knowledge society”. Similarly, Martin and Grudziecki (2006) define digital literacy as

”the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process” (2006, p. 255).

It is clear from these definitions that digital competence is not merely perceived as the ability to use software or operate digital devices but that it also incorporates other aspects which include the affective and motivation factors. Several authors (Teo, Lee, Chai, 2008; Teo, 2008; Huang and Liaw, 2005) have suggested that the success of implementing ICT in schools is highly dependent upon the support and beliefs of the practising teachers. In other words, if teachers are not convinced of the benefits of digital technology in the teaching process, they are less likely to include ICT in their lessons. This suggests that attitudes toward using computers in schools are important factors that affect the efficient implementation of ICT in teaching. While teachers' attitudes in relation to ICT use in education are undoubtedly crucial, Teo et al. (2008) have also suggested that the building of positive ICT attitudes should start at the pre-service level during teacher training. The main aim of the present paper is therefore to analyse the attitudes of future primary school teachers towards the use of ICT in teaching. To this purpose, a qualitative research study was conducted based on the analysis

of personal documentary material provided by students enrolled in a primary teacher education programme and aimed primarily at identifying their general attitudes towards using ICT in teaching, the ways they perceive and express the benefits and/or drawbacks of using computers in school, and the competences they associate with ICT use.

ATTITUDES TOWARDS USING ICT IN SCHOOLS

Attitudes towards the role and use of ICT in education have a considerable impact on the success of the practical implementation of ICT in the schooling process. According to a recent study conducted by the European Commission (2013) at EU level, a large majority of both school heads and teachers expressed positive attitudes towards ICT use and impact. It is also important to note that the examination of school heads' attitudes revealed no significant correlation as to their gender, age, years of experience, the school socio-economic background or type of location. As for the teachers, a positive correlation was observed between the teachers' attitudes and the length of time using ICT, the extent of use of ICT equipment in their lessons, the frequency of activities supported by ICT, their self-confidence in ICT related skills and their working experience. In addition, the results also showed that teachers are more likely to have positive attitudes if they teach in a school where there is a shared vision about ICT use.

On the other hand, the same study showed also some less encouraging trends in this area. While the number of teachers who have used ICT to prepare lessons increased between 2006 and 2013, the percentages of teachers using ICT in more than 25% of lessons were either stable or in decline. This downward trend is especially worrying considering the fact that there were fewer obstacles to ICT use in 2012 and that teachers' confidence in ICT skills (e.g. word processing, using email, preparing a multimedia presentation, and downloading and installing software) has increased (European Commission 2013).

A study of computer and information literacy conducted by Fraillon et al. (2014) also showed that teachers' attitudes towards ICT use are generally positive although it also revealed that a number of them are well aware of the various drawbacks of using technology in the classroom. The results of the study also showed that the teachers who are more confident of their digital competences and whose school environment offers substantial ICT support and cooperation between teachers are more likely to use ICT in their teaching.

One of the key findings of the European Commission report (2013, p. 14) is that "teachers' confidence and opinions about ICT use for teaching and learning affect the frequency of students' ICT use for learning: boosting teacher

professional development makes a difference, and appears to be a condition for an effective and efficient use of the available infrastructure.”

These conclusions emphasise the increasingly important role of the teachers' confidence level in their own ICT competences and their opinion about the relevance of ICT use for teaching and learning. Finally, the study also revealed no correlation between levels of ICT provision and student and teacher confidence, use and attitudes. This suggests that there may be other factors affecting teachers' confidence, use and attitudes in relation to ICT use which still needs to be identified and examined.

According to the results of the study carried out by Teo et al. (2008), future teachers' computer attitudes are significantly affected by the perceived usefulness of computers and the perceived ease of computer use, the subjective norm and facilitating conditions of ICT use. Another study, focused on the attitudes of pre-service teachers towards ICT use in teaching, was conducted by Ørnes et al. (2011, in Ottestad, Kelentrić and Guðmundsdóttir, 2014) The authors have concluded that future teachers perceive digital tools to be key tools in academic life with a considerable influence on the quality of their education, especially as regards opportunities for collaboration and contact between students and teachers, easier access to information and literature, and more variation in the use of learning materials.

In their study carried out in 1999, Willis, Thompson and Sadera reviewed the results of several studies according to which teachers were found to have generally positive attitudes about the use of technology in schools, but were far less confident of their ability to use technology in the classroom. In addition, they were of the opinion that their teacher training did not sufficiently prepare them to use technology in innovative ways. These results suggest that for an effective integration of ICT in teaching and learning, it is necessary to include strategies for raising ICT awareness and attitudes in teacher training programmes based on a "holistic approach, embracing awareness-raising, professional development (pre-service, induction and in-service), planning, and infrastructure" (Department of Education and Science, 2008, p. 111).

METHODOLOGY

The study presented in this paper is qualitative in nature. One of the benefits of qualitative research is its possibility to provide complex textual descriptions of participants' experiences of a certain research problem. This is especially precious in the research of emotions, beliefs and opinions. Furthermore, in qualitative research the information gained often allows the researcher a deeper insight into

the phenomenon under study. Among the methods for collecting qualitative data Kordeš and Smrdu (2015) mention also sources (besides interviews and observation) in the form of various types of documentary material which may be either personal or official (Mesec 1998). A personal document is a spontaneous first person description by an individual of his or her own actions, experiences or beliefs. Personal documents comprise, for example, diaries, letters, school essays, autobiographies or 'life histories', etc. The type of personal source used for the current research is an argumentative essay which the students had to write as a course requirement and was not primarily intended for research. As pointed out by Kordeš and Smrdu (2015), one of the benefits of qualitative research can also be seen in collecting data which were not primarily intended for the study undertaken. Such data represent phenomena as they occur in their natural environment and are not tainted by the research objectives or hypotheses.

One of the characteristics of qualitative research is that data is usually collected from a smaller sample than would be the case for quantitative approaches. The participants in this qualitative study were 27 student teachers enrolled in the third year of the study programme Primary School Teaching at the Faculty of Education of the University of Primorska. Data were collected on a voluntary basis during the second semester of the academic year 2017/18 in the course Written and Spoken Communication in English. The author was present throughout the data collection process which lasted 60 minutes. The students were asked to write an argumentative essay entitled "Computers should be banned from school" aimed at developing their academic writing competence. One of the limitations of the research is the fact that the essay had to be written in English which is not the students' native language and which could have been an obstacle to the students expressing their thoughts and opinions efficiently. On the other hand, the students who participated in the study are enrolled in the module Teaching English to Young Learners which means their English language competence is rated higher than the competence of other students in the study programme and would be equivalent to a B2 or C1 language competence level.

Research questions

The main research questions were the following:

1. What is the general attitude of pre-service teachers towards using ICT in primary schools?
2. How do pre-service teachers perceive the benefits and/or drawbacks of using ICT in teaching?
3. Which competences can be developed with ICT according to pre-service teachers?

Results

The results of the qualitative analysis are presented on the basis of the categories identified (in italics) for the research questions above. These are additionally documented with participants' direct quotations.

General attitudes towards using computers in teaching

One of the aims of the study was to establish whether the informants' attitude towards using ICT in education was generally more positive, more negative or balanced between the two. While the majority of the students agree that children are exposed to technology from an early age and that "technology runs the world", they expressed different overall attitudes towards using ICT in schools. The vast majority of students discussed the topic by pointing out both advantages and disadvantages of using computers in schools and therefore showed a more balanced attitude towards ICT use. Around a third of all the participants in the study expressed an overtly positive attitude towards using technology in schools, arguing mostly in favour of introducing ICT in teaching. Only two students focused primarily on the negative effects of ICT in education and expressed a distinctly negative attitude towards using computers in teaching.

Benefits of using computers in teaching

The main categories identified in relation to the benefits of using ICT in teaching were: motivation, learning efficiency, immediate feedback, learner autonomy, active learning, developing digital competences, and access to information.

One of the most important benefits of using ICT in teaching as reported by the future teachers involved in the research is *motivation*. Lessons supported by digital technology are considered more interesting and fun by the majority of the students in the study. Several students mentioned activities, such as games, quizzes, teaching materials, etc. which teachers can use to motivate learners to learn. As pointed out by one student, "pupils will be more interested in how the heart and blood circulation function with animation on a tablet screen than if they read about it in a course book".

In addition, teaching with ICT support is perceived as easier and better which increases the *efficiency of learning*. The latter is especially related to better memorisation owing to better support in terms of visualisation. As several students mentioned, ICT support helps the teacher convey and explain complex concepts more efficiently and enhances the pupils' understanding. For example, videos allow children to see something they were not able to see before or see

things more explicitly and thus increase their understanding of a particular phenomenon. Furthermore, ICT assisted teaching enables *immediate feedback* which is rarely possible in teaching without computers. Learners can get information on their performance instantly and the teacher can monitor their progress in a more systematic way. Moreover, ICT can be an efficient tool for teaching pupils with learning disabilities. It can be an empowering experience for both teachers and learners.

Next, by using ICT in teaching and learning, pupils become more independent and *autonomous learners*. They can work on their own also outside the classroom and they can practice independently at home. Another important aspect is that pupils can learn at their own pace and taking into account their level of competence. ICT supported teaching also gives children the opportunity to develop creativity and independent thinking but also to encourage them to explore a topic on their own.

According to the participants in the study, ICT also gives the learners the opportunity to be more *actively involved* in learning, such as through projects. This increases pupil participation and positive interaction between students and teachers. For example, learners can cooperate with the teacher to contact people all around the world using the Skype application. In this way learners will feel more included, keener to learn.

Among the benefits of ICT use, several students mentioned the development of *digital competence*. ICT is seen as a “precious tool, like a ruler, calculator or pencil”. Children will use technology in their future life so they need to be able to know all the possibilities offered by ICT. The participants in the study expressed the opinion that several tools and applications are very useful and are already used by a number of teachers, such as the power point or the e-classroom, but also activities like blogging and creating videos. Furthermore, the development of digital competence also involves learning to use technology safely. As pointed one by one student, “they will use it anyway but by including technology in school we have the opportunity to show them how to use it safely and reliably”. Another related view connects the benefits of using ICT with a number of advanced devices available today, like virtual reality headsets which can be used in schools for teaching. As one student pointed out “we could have virtual science classes for dangerous lab experiments” and “if we want our children to become doctors, pilots and engineers, we need to give them ICT knowledge”.

Several students see *access to information* as one of the most valuable advantages in introducing ICT in schools. Facts and specific content can be accessed easily and, above all, instantly. One of the participants expressed this view by writing that “there is no use having our children memorise pages upon pages of facts if we can teach them how to find them when they need them”.

Finally, an important benefit of using ICT in teaching as seen by pre-service teachers is in the fact that "children's brains are already used to computers" and that "ICT is a child's reality from their birth".

Drawbacks of ICT use

With respect to the disadvantages of using ICT in schools, the following categories were identified: health problems, loss of touch with reality, lack of interpersonal communication, teachers' poor ICT competence, safety issues, and lack of creativity.

First of all, the majority of participants in the study mentioned *health related problems* as the most important disadvantage of using computers in schools. Because of ICT exposure, children are in danger of developing poor eyesight, back pain, inflammation of the carpal tunnel, etc. Several students also mentioned various physical problems and insufficient development of fine motor skills. There is a general agreement among the participants that "spending too much time in front of computers" is not healthy for the learners in primary school. A number of students also mentioned the possibility of children becoming addicted to digital technology.

According to the participants in the study, an important consequence of using ICT in schools may also be a *loss of touch with reality*. With an increasingly more important role of technology in their lives, children are losing the connection with nature and the opportunity to fully develop all their senses. Several students also added that children spend too much time in front of computers outside school, so it is not sensible to expose them to digital technology also during the lessons. As one student commented, "teachers should do everything in their power to get those kids back to reality", while another participant expressed his/her concern at using too much ICT by writing that "instead of learning how to care for plants in nature, they play a game in which they plant trees on computers".

Third, ICT use is often perceived as a negative distraction, a few students expressed the conviction that ICT use may lead to children *losing the ability and willingness to communicate* with their peers. Using digital technology in teaching may negatively affect the learners' social and interaction skills. Rather than spending time doing activities with ICT, children "need to learn other things, such as how to interact with their school mates". One of the students also commented that children are becoming "less human".

The next drawback refers to *teachers' competence* in using computer technology. Several students commented that teachers are not sufficiently qualified for using ICT efficiently, especially teachers with longer working experience. In addition, schools and teachers may not have access to high quality digital equipment. A few students also mentioned *safety issues* and data theft.

Finally, some of the disadvantages mirror the arguments in favour of using ICT. Several students expressed doubt at the efficiency of learning with computers, especially as regards developing *creative thinking*, writing and drawing skills, but also motor abilities. As one of the participants commented, "the web is full of ideas so children are not willing to think with their own heads anymore", while another mentioned that "computers are too helpful" and make everyone, also the teachers, lazy. As a consequence, the children are less autonomous and have fewer opportunities to show their knowledge.

Developing competences with ICT

ICT use is related to several competences and skills. As perceived by future teachers in primary school, the most important competences developed through ICT are connected with the technical use of ICT, such as presentation skills, writing electronic messages, and fast writing. In addition, one of the participants mentioned that children should learn programming and code-function writing and added that ICT classes "should be obligatory for everyone".

Moreover, several students mentioned the development of critical thinking and the skills for distinguishing between reliable and unreliable sources. Another competence mentioned in the essays is the ability to identify relevant content and safe use of the Internet.

Several students also described examples of good practice which they came across during their teaching practice. For example, to show the differences between Ancient Rome and Rome today we can use the application Google Street and compare the Constantine arch or the amphitheatre with a picture of the two from ancient times. Another student mentioned the role of videos and the fact that children can now see many things more explicitly, such as how animals move in different living environments or how cars are assembled.

CONCLUSION

The analysis of pre-service teachers' attitudes toward using computer technology in teaching showed that they are well aware of the advantages and disadvantages related to ICT use. The qualitative approach based on personal documentary materials in the form of argumentative essays gave us the possibility to collect information which enables us to get a deeper insight into the ways future teachers perceive digital technology and reflects different important aspects of attitudes towards ICT use. By analysing the way they developed arguments in the essay, the current researchers were able to see how primary school teaching

students perceive and elaborate both the benefits and drawbacks of ICT use in teaching. They were able to express and illustrate with convincing examples the positive aspects, such as higher motivation, immediate feedback, learner autonomy, etc. Although the students' attitudes towards ICT use in school can be said to be generally positive, it is also evident that they are conscious of the negative effects, such as health related problems or the fact that ICT may hinder creativity development. This is in line with the findings reported by several studies conducted in this area.

One of the main assumptions of the present research is that a teacher's attitude towards learning and teaching is an important determinant of the learners' performance and their motivation to learn. It is therefore recommended to provide future teachers with the experiences and knowledge which will help them to make an efficient and sensible use of ICT in their teaching. Another related issue which is worth exploring in the future is the level of pre-service teachers' digital competence which may also have a considerable impact on their future schooling practices and, as a result, on the digital competence of their pupils.

REFERENCES

- European Commission (2013). *Survey of schools: ICT in education. Benchmarking access, use and attitudes to technology in Europe's schools (final report)*. Brussels, Belgium. Retrieved from <https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/KK-31-13-401-EN-N.pdf>
- Department of Education and Science (2008). *ICT in Schools*. Dublin: Department of Education and Science. Retrieved from <https://www.education.ie/en/Publications/Inspection-Reports-Publications/Evaluation-Reports-Guidelines/ICT-in-Schools-Inspectorate-Evaluation-Studies.pdf>
- Fraillon, J., Ainley, J., Schulz, W., & Friedman, T. (2014). *Preparing for life in a digital age: The IEA International Computer and Information Literacy Study international report*. Melbourne, Australia: Springer.
- Huang, H. M., & Liaw, S. S. (2005). Exploring users' attitudes and intentions toward the web as a survey tool. *Computers in human behavior*, 21(5), 729–743.
- Kordeš, U., Smrdu, M. (2015). *Osnove kvalitativnega raziskovanja*. Koper: Založba Univerze na Primorskem.
- Krek, J., & Metljak, M., eds. (2011). *Bela knjiga o vzgoji in izobraževanju v RS 2011*. Ljubljana: Ministrstvo za šolstvo in šport.
- Kreuh, N. (2012). *Pot do e-kompetentnosti*. Ljubljana: Ministrstvo za izobraževanje, znanost, kulturo in šport.
- Kreuh, N. in Brečko, B. (2011). *Izhodišča standarda e-kompetentni učitelj, ravnatelj in računalnikar*. Ljubljana: Zavod RS za šolstvo.
- Martin, A., & Grudziecki, J. (2006). DigEuLit: concepts and tools for digital literacy development. *Innovation in Teaching and Learning in Information and Computer Sciences*, 5(4), 1–19.

- Ministrstvo za izobraževanje, znanost in šport. (2016). *Strateške usmeritve nadaljnega uvajanja IKT v slovenske VIZ do leta 2020*. Ljubljana: Ministrstvo za izobraževanje, znanost in šport.
- Mesec, B.(1998). *Uvod v kvalitativno raziskovanje v socialnem delu*. Ljubljana: Visoka šola za socialno delo.
- Ottestad, G., Kelentrić, M., & Guðmundsdóttir, G. B. (2014). Professional digital competence in teacher education. *Nordic Journal of Digital Literacy*, 9(04), 243–249.
- Røkenes, F. M., & Krumsvik, R. J. (2014). Development of student teachers' digital competence in teacher education—A literature review. *Nordic Journal of Digital Literacy*, 9(04), 250-280.
- Teo, T. (2008). Pre-service teachers' attitudes towards computer use: A Singapore survey. *Australasian Journal of Educational Technology*, 24(4).
- Teo, T., Lee, C. B., & Chai, C. S. (2008). Understanding pre-service teachers' computer attitudes: applying and extending the technology acceptance model. *Journal of computer assisted learning*, 24(2), 128–143.
- Willis, J., Thompson, A., & Sadara, W. (1999). Research on technology and teacher education: Current status and future directions. *Educational technology research and development*, 47(4), 29–45.