R&E-SOURCE https://journal.ph-noe.ac.at
Online Journal for Research and Education
Special Issue 18, June 2020, ISSN 2313-1640

Digital Technologies as a Means of Teachers' Professional Development

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Abstract

The profession of teachers is among those which require continuous learning regardless the occurring barriers in learning. For schools, well-prepared teachers represent an advantage in the market. Moreover, upgrading their knowledge regularly and developing their skills significantly increases the quality and the efficiency of teachers' educational work. Therefore, most teachers are involved in various lifelong learning programmes or activities, although many of them have problems to synchronise their learning with their personal and professional lives.

In the presented paper, the authors deal with the role of digital technologies in in-service teachers' personal and professional development with a focus on the benefits which the application of digital technologies for educational purposes brings for both teachers and schools, which must face a range of demanding situations (see e.g. Lajčin & Hrmo & Krištofiaková, 2014), including global crisis or pandemic. A literature review showed that the application of digital technologies and using the online environment for teachers' further education activities appear to be suitable and attractive for in-service teachers.

Keywords:
Digital technologies
Teachers
Professional development

1 Introduction

For teachers, involvement in further education and training is a necessity. Upgrading their knowledge and skills represents an undeniable advantage on the educational market (Hužovičová & Jakúbek, 2014), but also contributes to teachers' professional and personal growth (Tamášová, 2015). If they want to keep pace with current knowledge, they need to develop their skills and take part in lifelong learning activities throughout their entire lives. They must be well prepared for various, even unexpected or unpredictable situations, including global crisis or pandemic, when traditional schemes and procedures are simply useless as the conditions, needs and requirements of all stakeholders change in one moment. The reality of pandemic, with schools closed and other restrictions, has shown how important digital technologies in education are and that online education represents an efficient alternative to the traditional presence form of education from primary education to lifelong learning.

Although participation in formal in-service training, involvement in various forms of non-formal and informal education, as well as self-learning can significantly increase the quality and the efficiency of teachers' educational work – and these are also important from the aspect of their career advancement – many teachers are demotivated by the barriers related to adult learning they must overcome (see e.g. Porubčanová & Pasternáková & Gabrhelová, 2016). For them, lifelong learning activities based on using digital technologies may represent an optimal solution as they enable personalized learning, which is accessible, flexible, and open for everyone.

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2 Digital technologies in lifelong learning

With the ongoing implementation of digital technologies into the educational practice, it has come to significant changes in the work of schools – new forms and methods of teaching have been introduced. Digital technologies open new opportunities in distance education, e-learning, blended learning, but also in face-to-face education (Barnová & Krásna & Gabrhelová, 2019a). Moreover, the current trends indicate a further enormous development of digital technologies and an increasing tendency of their application for educational purposes, which, under certain circumstances, can lead to higher efficiency in teachers' work.

In education, efforts are made to find the most effective ways of using digital technologies combining the latest knowledge from the fields of pedagogy and informatics. Educational institutions are offered new opportunities within their educational work, which can be made multimedial, and thus – using multiple input – they can provide their content to a wider scope of users from various backgrounds and in various educational contexts. Experience has shown that multimediality increases individuals' motivation for learning, too. In addition, digital technologies enable their users – learners – to adapt their learning environment to their preferences and so, regulate their own learning process. To a certain extent, application of digital technologies can replace teachers, more precisely, some activities of teachers.

In adult learning, the advantages of a recent phenomenon represented by permanent connectedness can be used. Connectedness has a strong impact on education as it has brought significant changes in the ways people access, publish and share information. One of the benefits that connectedness brings is that it helps creating communities and changes the character of social interaction and relationships – connectedness changes communication to interaction (Barnová & Krásna, 2018, 2019a). Digital technologies promote independence and interaction, they enable visualisation of the teaching content, and simulation of processes. At the same time, several threats and difficulties can occur. In learning, it must be taken into account that the ability to actively deal with digital information and media and to communicate with others in the virtual environment (OECD, 2012) are important.

3 Teachers and digital literacy

The level of teachers' digital literacy, which significantly broadens the scope of potential sources of knowledge (Karpati, 2011), can be decisive from the aspect of the success of both their teaching and learning activities. UNESCO defines digital literacy as a life skill and a set of basic skills which include the use and production of digital media, information processing and retrieval, participation in social networks for creation and sharing of knowledge, and a wide range of professional computing skills. According to Eurostat (https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Digital_literacy), digital literacy refers to the skills required to achieve digital competence, the confident and critical use of information and communication technology (ICT) for work, leisure, learning and communication. So, digital literacy is not only about teachers' technical ability in using digital media but mainly about the soft skills and knowledge behind it related to the anticipation of e-threats, understanding the social mechanisms mediated by the Internet, and digital technologies (Tomczyk, 2019). Among the most important components of digital literacy are: accessing, managing, evaluating (adequacy, currency, usefulness, quality, relevance, or efficiency), integrating (synthesizing, summarizing, comparing, and contrasting information), creating, and communicating information individually or collaboratively in a networked, computer supported, and web-based environment for learning, working, or leisure (Karpati, 2011). According to Hague and Payton (2010), digital literacy is made up of eight inter-related components or dimensions: functional skills, creativity, critical thinking and evaluation, cultural and social understanding, collaboration, the ability to find and select information, effective communication, and e-safety.

In the case of teachers, being digitally literate also means knowing when and why digital technologies are appropriate and helpful to the (educational) task at hand and when they are not (Hague & Payton, 2010) – i.e. teachers should be able to differentiate between those contexts when the application of digital technologies is purposeful, meaningful, and efficient; and situations, when it is not.

4 Teachers using digital technologies for learning

Over the last two decades, the educational needs of individuals and of the entire society have changed and in the context of schools, due to the particularities of the work of teachers and the specific requirements placed on them, a strong need for replacing the traditional forms of their further education by those more corresponding with their current needs occurred. The methods of personalized and individualized instruction in the online environment have become very popular among them, which, compared with the traditional ones, can be characterized as more open and flexible. This is an important factor from schools' point of view as well, as for them, on-line education of their personnel represent a cost saving solution which does not put any demands on the organization or the educational process as such.

Experience shows that currently, personalized forms of education are frequently opted for among teachers because they can be adjusted to their timetable at school and are easy to synchronize with their other duties both in and outside the school. In the case of teachers, the virtual learning environment is often used for the purposes of both self-directed learning and guided learning.

Teachers are typically involved in the following three basic forms of e-learning activities characterized by Aceto and Dondi (n.d.):

1. Workplace training in the form of a structured educational program carried out online or in the form of blended learning. In some cases, only certain segments of an educational program (corresponding to the needs of a particular school) are selected.
2. Inter-institutional education providing space for relatively new learning opportunities. It is exclusively based on mutual communication between schools and teachers for the purpose of sharing information and examples of good practice.
3. Professional educational networks, which are virtual communities of teachers providing discussion forums for exchanging professional knowledge and experiences.

There are many teachers who are not confident in using digital technologies and feel anxious about using them in the classroom as they feel that their own functional skills are not as developed as their students'. Even if a teacher is less experienced and knows less than a student about how to operate a particular piece of technology, it does not necessarily mean that they are digitally illiterate. They are still more equipped with the higher order critical thinking skills and the subject knowledge to apply to digital technologies (Hague & Payton, 2010).

Another benefit of teachers' involvement in on-line learning activities – alongside with the fact that it can be useful from the point of view of gaining new knowledge and development of their skills and abilities – is that it provides teachers with an opportunity to try what it is like to use digital technologies from the perspective of a learner and use this experience in designing their teaching activities. They can learn about the attractiveness, and efficiency of various tools, methods and activities and get inspiration for improving their teaching practice.

5 E-learning in teachers' professional development

E-learning is usually defined as a form of distance learning outside of a traditional classroom where electronic devices and the Internet are used. E-learning helps individuals to create a personalized learning environment based on the application of such tools which adapt to their preferences (Shahabadi & Uplane, 2015) through making processes more adaptive and interactive. E-learning also enables self-paced learning where, if needed, the same topic can be discussed several times, the entire communication can be recorded and learning can be enhanced by using individualized tools.

Asynchronous e-learning is a learner-centred process which facilitates information sharing on-line regardless of the constraints of time and place among a network of people. It combines self-study with asynchronous interactions to promote learning (Shahabadi & Uplane, 2015). The disadvantage of asynchronous communication lies in the fact that learners do not receive immediate answers to their questions or immediate help – there is always a time gap. Learners can contact the teacher or instructor e.g. via e-mail, which gives the educator sufficient time to think about the answer, to search additional information and formulate the answer carefully. From the perspective of educators, it can be perceived as an advantage.

With the ongoing advancement of technologies, synchronous e-learning as a live, real-time (and usually scheduled), facilitated instruction and learning-oriented interaction (Shahabadi & Uplane, 2015), which can be characterized by the presence of the teacher/instructor and real-time interaction, was introduced. Students and

teachers, lecturers or instructors can chat on social networks or in an applied virtual learning environment in real time – they can interact simultaneously.

E-learning is undoubtedly an effective form of education, which has benefits for both teachers and schools where they are employed. Using the on-line environment completely eliminates travelling costs and is time saving as there is no need to commute. It is available 24/7 and it is accessible any time and from anywhere with no time restrictions, which means that it reduces stress from being absent at school and no substitution for the learning teacher is needed. Another advantage of e-learning is that it saves time, which the learners can spend with their families or by leisure time activities.

5.1 M-learning

Smartphones have become a part of our everyday lives. Compared to older devices, their main advantage is that they can completely replace computers and they ensure their users 24/7 connectedness. By means of them, users can share and receive information, create new content, take notes, make videos, presentations, take pictures, etc. So, smartphones are used as working tools and have the potential to find application in education of children, youth and adults as well. M-learning or mobile learning is built on the premise that almost everyone owns a smartphone and can use it for educational purposes whether in classroom or not. As Eurostat data show, in 2017, the number of mobile phone subscriptions was higher than the number of inhabitants.

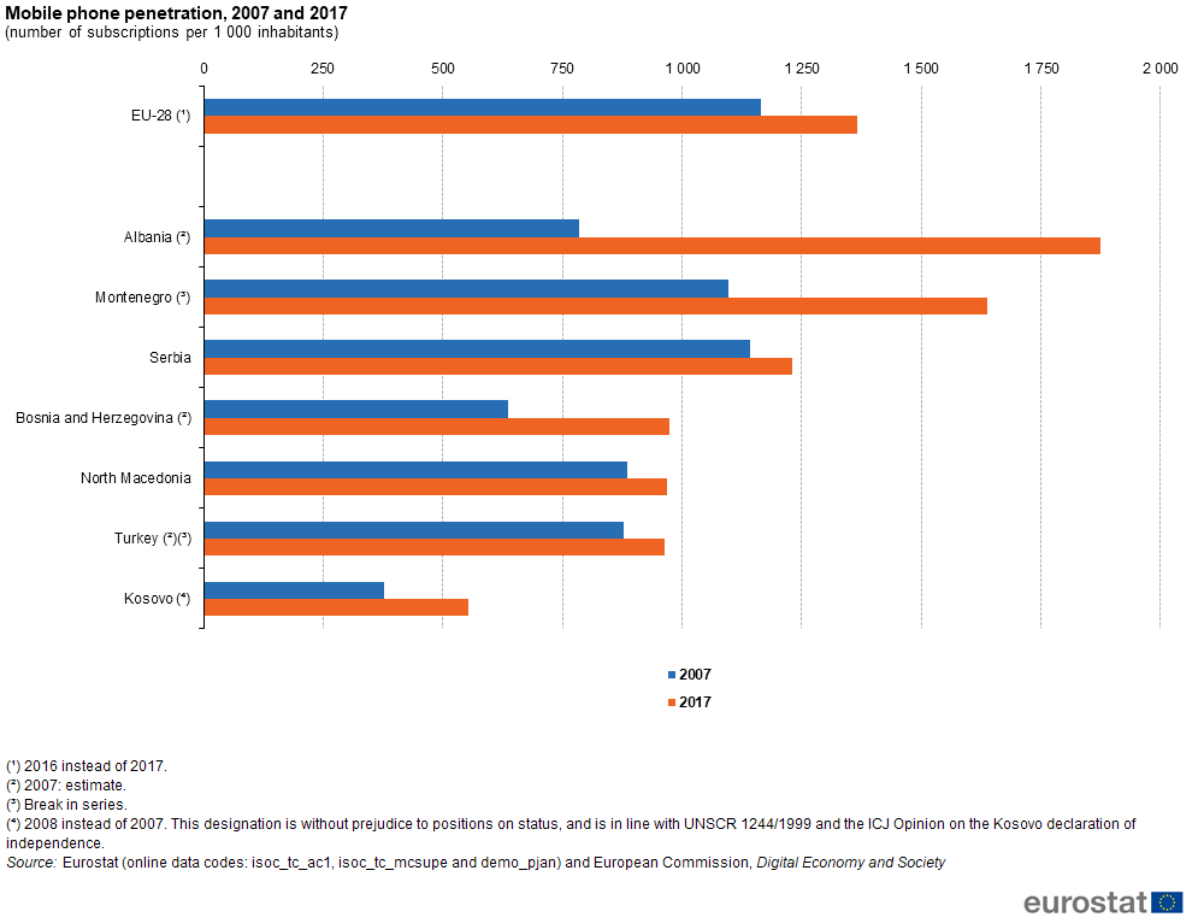

Fig. 1: Mobile phone penetration, 2007 and 2017 (number of subscriptions per 1 000 inhabitants). Source: Eurostat and European Commission, Digital Economy and Society.

In the last few years, smartphones have become a frequently used educational aid, the application of which – according to Naismith and Corlett (2006) – has several benefits in the form of increased motivation, engagement, personalization, collaboration, interactivity, and sense of community. They are used both in

distance education and full-time education (BYOD – bring your own device) as they are affordable for everyone, portable and always at hand.

6 Novice teachers

Novice teachers lack experience and often need help in handling various situation or problems. They need someone who can help them find answers to their questions, or who can lead them towards knowledge and help them develop their skills, competencies, and abilities they need for successful realization of the educational process. In this case, e-tutoring and e-mentoring as modern forms of tutoring and mentoring can find their application.

6.1 E-tutoring

In school environments, tutoring can be defined as a process based on the relationship of a tutor (an experienced teacher) and a tutee (a novice teacher) in the process of professional development (What is tutoring?) of a teacher. Tutors provide their tutees with guidance, counselling or supervision, but they do not offer ready-to-use solutions – they require critical thinking and argumentation (Barna, 2019). They prepare independent teachers, show them how to handle various situations, and gradually lead them to the state when they can find answers without their tutor's help. Such an adult-to-adult guidance with its advantages appears to be an effective form of adult education (Barnová & Krásna, 2019b) and tutoring is the option frequently applied in working environments.

E-tutoring is the innovative form of tutoring realized online, which can be considered the optimal solution in contexts, where regular face-to-face communication is difficult or even impossible. Its advantage for the learner is that the development of social networks has made "here and now" real-time communication between the tutor and the tutee possible.

6.2 E-mentoring

Mentoring is another form of a relationships between a more experienced teacher and a less experienced colleague. Mentors are experts in their fields providing counselling and lead beginners or less experienced colleagues, motivate them, give them feedback and represents a professional model with the aim to help less experienced colleagues achieve their goals and find optimal solutions to existing problems by means of appropriate questions leading towards independent thinking (Holmitz & Berge, 2008). Their role is to develop novice teachers' professional skills and competences. Mentoring can be a spontaneous, voluntary relationship between two persons when the mentee can decide on the pace and intensity of learning, but it can also be the school manager's requirement to be involved in mentoring when a new teacher comes to the school, or if someone should improve in a certain field (Barnová & Krásna & Gabrhelová, 2019b).

Ensher and Murphy (2007) define e-mentoring as a mutually beneficial relationship between a mentor and a protégé, which provides new learning as well as career and emotional support, primarily through e-mail and other electronic means (e.g. instant messaging, chatrooms, social networking spaces, etc.).

7 Conclusions

Digital technologies are here to help people, to make individuals' lives easier. They offer teachers new opportunities in their educational work, but they can also serve them for the purposes of their own learning. They can find their application in self-education, as well as in a range of formal and non-formal learning activities. Learning online is affordable, accessible, open, and flexible, so, teachers can make their learning self-paced and personalized, which means that their learning can be easily synchronized with their duties and other activities.

The recent situation during pandemic highlighted the importance of teachers' digital literacy and of their ability to take advantage of the opportunities offered by the virtual environment. It is the application of digital technologies which can bring a solution in crisis situations when presence forms of education are not available.

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