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Current Trends in Using Digital Technologies in Vocational Schools

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Abstract

Digital technologies have penetrated into every sphere of human life, so it is not a matter of questioning whether to use them in vocational schools or not. They have the potential to increase the quality of education in schools but they can help students when doing their homework as well. The presented paper is focused on the opportunities which digital technologies and the virtual environment provide to vocational schools and teachers from the aspects of increasing the interactivity and multimediality in education, and developing students' independence.

Keywords:
Vocational schools
Digital Technologies
Virtual Generation

1 Introduction

Curriculum content design of vocational subjects and the possibilities of its mediation within the educational process in schools and other forms of education are in centre of attention of research in the field of didactics of vocational subject (www.stuba.sk/new/docs//stu/pracoviska/icv/skriptum_didaktika_1.doc). According to Turek (2014), didactics is a pedagogical discipline focusing on the educational process as a unity of teachers' activities (teaching) and the activities of learners (learning). While general didactics deals with the questions of the educational process in general, didactics of vocational subjects focuses on the particularities of teaching and studying vocational subjects. It integrates knowledge from a range of disciplines: technology, pedagogy, psychology, philosophy, sociology, cybernetics, theory of information, mathematics, statistics, logic, etc.

In the context of ongoing social changes, it has come to a significant shift in the field of didactics, too. It must respond to the current needs and requirement not only in the labour market and the society, but also to the specifics of students, and the expectations of their parents. The issues of the process of replacing the traditional forms and methods of education by modern ones have been broadly discussed among professionals for several years. There is a strong need to react to the current trends and to develop students' critical thinking, creativity, their ability of constructive problem solving, and to place more emphasis on selecting and processing information instead of "storing" knowledge by students.

2 The changing needs of vocational school students

Over the last decade, the members of the so-called "Virtual Generation" or "Generation Z" have replaced the "Generation Y" in secondary school. In scholarly literature, these young people, born after 1995, are also called "Digital Natives" because they were born into the digital world, and they cannot even imagine what life was like before the existence of the Internet and highly developed skills in using digital technologies are typical for them.

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Even intuitive usage of new technologies and manipulation with them can be observed in youth (Barnová & Krásna, 2018).

Research shows that the young generation is permanently connected and they use the Internet more frequently than other age groups. Based on the data by Eurostat, Fig. 1 shows that a far higher proportion of young people made use of a computer and the internet on a daily basis than the rest of the population in the observed period of time.

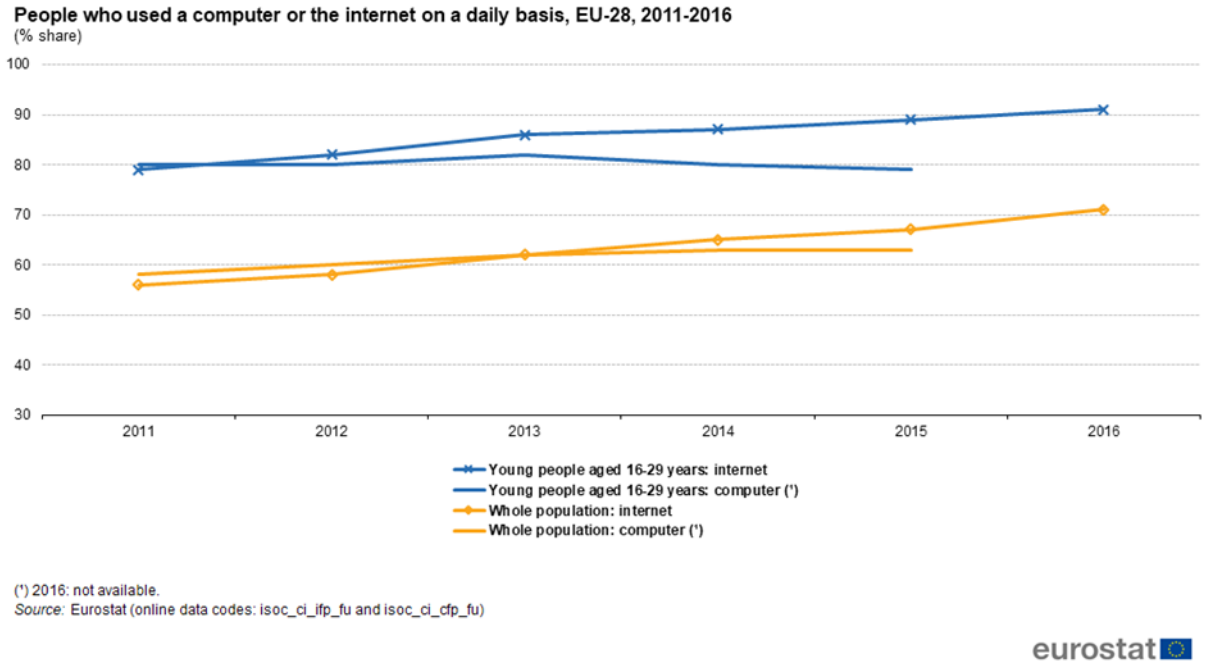

Fig. 1: People who used a computer or the internet on a daily basis. Source: Eurostat.

Also the character of teenagers' social contacts has changed under the impact of using social networks. Their social relationships are often virtual and, in their communication with their peers, they use abbreviations, symbols, icons, and pictures, which have become a part of their culture. Schools must realize that these have become so natural for them that, if teachers want to approach their students and motivate them, these – to a reasonable extent – should find their place in education as well. In the context of digital technologies and the application of the on-line environment in education, it can be assumed that, while for teachers, they represent teaching aids, students perceive them as an alternative, often more attractive learning environment.

Students' permanent screen exposure and its negative impact on them brings implications for the educational work with this generation as well – e.g. students' cognitive processes are accelerated, they are overloaded by a continuous flow of information, and, as a consequence, their attention span is very short compared to the previous generations. It follows from the above, that the teaching content should be presented in shorter segments and should be visualized using pictures, diagrams, videos, etc. Another important factor having a significant impact on the schools' educational work is that students can access any information on the Internet by only several clicks, i.e. in a very short time. Therefore, they are often impatient if they are not offered immediate solutions or they have to wait for the answers to their questions. This has been confirmed by Rothman's (2016) research findings which show that the representatives of the "Virtual Generation" prefer interactive games and collaborative projects to presentations and discussions.

3 Digital technologies in the classroom

As mentioned above, appropriately selected digital technologies can increase the quality and the effectiveness of teaching, as well as home preparation of students, but they cannot replace teachers completely. They should be perceived as teaching aids or tools which are used to help teachers and students achieve their goals. Therefore, when using technologies, it must be considered whether they are suitable and if their application is reasonable. Munoz (1993) warns teachers that intuition, judgment, imagination, and creativity cannot be

replaced and that technology may fail if it is viewed as change for the sake of change. There is a range of situations when the application of digital technologies is not necessary, or is even counterproductive. Digital technologies should be opted by teachers only in situations when they can increase students' motivation and contribute to the quality of classroom work.

Digital technologies, if used in accordance with the principle of availability, meaningfulness and effectiveness (Krásna & Barnová, 2018; Barnová & Krásna & Gabrhelová, 2019), contribute to a more efficient educational process (Hrmo & Krištofiaková, 2008), which is realized on the borderline between the real and the virtual world (Barnová & Krásna, 2018). They represent tools helping adapt the educational process to the needs of individual students and their leaning styles, as well as to replace communication by interaction in the classroom – whether traditional or virtual. Available research shows that interaction makes learning more attractive for students and significantly increases their motivation.

Undoubtedly, implementation of digital technologies is attractive to many students and can change "boring" teaching content to "interesting" as interactive and dynamic activities respond to the needs of the most members of the "Virtual Generation". Digital technologies can promote the development of learning strategies in students and they provide students with opportunities for social interactions and thus, promote collaborative learning.

4 Digital technologies in vocational schools

Digital technologies have become an integral part of everyday life of almost everyone. They have penetrated to workplaces and households, and very quickly found their application in schools, too. The fact that they enable immediate communication, as well as fast and effective searching, analysis, usage, creation and publishing information (Pettey, 2015), contributed to their popularity. In education, they are usually associated with distance forms of leaning, but digital technologies can be well applied in traditional classrooms as well. In (not only) vocational schools, by means of digital technologies, teachers can visualize information and simulate processes during lessons. One of their pros is that they make education multimedial and interactive. In spite of it, currently, many schools do not realize the educational potential of digital technologies and the virtual environment. Even though, over the past years, an increase in the digital literacy and using digital technologies and the Internet in education can be observed, there is still a group of teachers who do not implement online activities into their teaching, use digital technologies only passively during presentations of new content, or do not use digital technologies in the classroom at all. If this is the case, lessons are not interactive and the students are only passive participants of the educational process. Ertmer (1999) grouped the barriers in using digital technologies to two categories:

1. first-order barriers extrinsic to teachers (access, time, support, resources, training) and
2. second-order barriers intrinsic to teachers (attitudes, beliefs, practices, resistance).

She also noted that even if every first-order barrier were removed, teachers would not automatically use technology in the classroom.

Modern technologies have the potential to help vocational school teachers in the realization of their everyday educational work and completing tasks both in general academic and vocational subjects. They promote the effectiveness of teaching, activating and motivating students and in certain contexts, they can carry out teachers' tasks. Digital technologies, if used by teachers reasonably, are useful when modelling situations, carrying out experiments, studying various phenomena, but also by data processing, gathering, sorting and exchanging information. Digital technologies also enable students to work with educational programmes. Safe working with digital technologies requires a sufficient level of students' digital literacy, and therefore, it is important to focus on the development of their critical thinking and other skills necessary for evaluating information.

Digital technologies can be used at every stage of the realization of a teaching unit – starting from lesson planning and ending with doing homework by students. Among the advantages of using digital technologies in this context is easy storage of materials which can be used later for a range of purposes.

4.1 Computers and laptops

Computers and laptops are tools, the usage of which has a significant impact on the effectiveness of both teachers' and students' work. They also serve as a teaching aid. By teachers, they are most frequently used for the purposes of designing tests, worksheets, tasks, exercises and other materials which can be stored, copied,

and modified, but also for presentations.

4.2 Digital projectors

Digital projectors connected to other technologies are among the most frequently used devices in education. They belong to the group of audio-visual technologies. They are used during teachers' presentations when mediating new knowledge or for presentation of students' work. They are also suitable for simulation of experiments or various processes in vocational schools.

4.3 Interactive whiteboards

Interactive whiteboards belong to the modern teaching aids popular at every level of schools. They are touch sensitive interactive displays connected to a computer and a digital projector. Among their potential applications are:

- using web-based resources in whole-class teaching;
- showing video clips to help explain concepts;
- demonstrating a piece of software;
- presenting students' work to the rest of the class;
- creating digital flipcharts;
- manipulating text and practising handwriting;
- saving notes written on the board for future use;
- quick and seamless revision (Becta, 2003).

Based on Becta research (2003), application of interactive whiteboards encourages more varied, creative and seamless use of teaching materials, engages students to a greater extent than conventional whole-class teaching, increases enjoyment and motivation, and facilitates student participation through the ability to interact with materials on the board.

4.4 Smartphones and tablets

Smartphones and tables are relatively small devices which are portable and always at hand. Their advantage is that in education, they can replace computers to a great extent. Smartphones and tablets enable browsing on the internet, taking pictures, using various apps, translators, and maps, taking notes, using social networks, sending and receiving e-mails, etc. All these functions can be used for educational purposes (M-Learning) and make students' learning more attractive.

4.5 Clickers

Clickers are an interactive technology that enables teachers to ask questions to students and immediately collect and view the anonymous responses of the entire class. In Slovakia, they are not frequently applied.

5 Conclusions

The benefits of using digital technologies overweight their shortcomings. They represent a contribution and bring new opportunities to both general academic subjects and vocational subjects in secondary education. Based on the above, it can be assumed that teachers will be forced to change their approach gradually, they will have to use modern teaching aids and technology, to adapt educational materials to the needs of their students and make their education more interactive. But teachers must be aware of the fact that placing computers and software in classrooms is not enough and it is not a matter of questioning whether technology "works". As pointed out by Earle (2002), the real issue is when and under what circumstances they should be applied, and, like with any other tool, teachers have to come up with a strategy or pedagogy to make it work.

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