Distance Education through Information and Communication Technologies

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Abstract

The article deals with distance education through information and communication technologies, which has many advantages compared to traditional forms of education but also disadvantages. On the one hand, it allows to rationalise the work of teachers, helps to break down stereotyped activities, and makes it possible to interest and activate students. Still, on the other hand, not enough attention is paid to addressing psychological, sociological, and pedagogical problems. Flexibility and convenience can be included among the positives, i.e., learning for students at times that suit them best and in environments that stimulate them or where they feel comfortable.

Keywords: Information and communication technologies, Distance Education, Teacher and pupil

1 Introduction

A transfer from a traditional, face-to-face form of education to distance education with the use of online teaching has brought many new impulses that contribute to the development of digital literacy of both teachers and students. However, online education also has specific negative implications, particularly in the social and interpersonal areas. The purpose of using information and communication technology (ICT) in online education is to provide all students with an opportunity to learn how to use ICT and hence improve their learning. However, the pandemic period is now over. For students to use ICT for their learning activities, they must

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have such ICT at their disposal when they need it, and the ICT must correspond to the purpose of satisfying their individual learning needs. It means that more is needed to have access to ICT; it is also important how the use of ICT by students is supported to meet their individual needs to the maximum possible extent.

All students, including those with health impairments and special educational needs, should be supported by teachers and other professionals to improve and advance their ability to use ICT and become self-confident ICT users when learning. This requires students to develop their ICT skills gradually.

Furthermore, it also requires teachers to apply structured procedures when assessing ICT-related and use such methods to identify the practical needs of individual students as to the use of particular ICT tools. In this way, students can learn how to evaluate and manage their access to ICT and their preferences for assistive technology.

Based on a document published by the European Agency for Special Needs and Inclusive Education the utilisation of ICT as an efficient tool for individualised education is conditioned by the teachers' clear understanding of the ICT potential for supporting the strategies of "learning how to learn" (metacognition) and active approaches to teaching. Parents and legal representatives of students play a crucial role in supporting the processes of individualised education and developing strategies aimed at their active participation in their children's education. Supporting the use of ICT as a tool for parent-teacher interactions and communication is essential for school teams. (ICT in Inclusive Education, pp. 22–24)

2   School Teams and ICT

Students have increasing access to a much wider variety of digital learning materials at school and at home. As a result, three new tasks are imposed on school teams:

- To ensure students' safe use of ICT (also called electronic safety). Students with health impairments and special educational needs are potentially at risk of being abused online (e.g., online bullying). Moreover, it is also challenging for such vulnerable students to access assistance provided in the form of support, guidance, or sources for using ICT. To ensure the electronic safety of students, it is necessary to include the issues regarding the safe use of ICT in the extensive curricula of all students since their early childhood to achieve their emotional, social, and digital literacy.
- To harmonise all teaching materials with accessibility standards. The goal is to achieve that accessibility is perceived as a matter concerning all of us and that all authors and producers of teaching materials are adequately trained and equipped to produce accessible materials.
- To include digital education strategies for practical evaluation, planning and teaching. This includes using accessible ICT as a tool for simplifying and improving procedures for teaching and education based on cooperation, tutorship, joint problem solving and creating heterogenic groups within the educational activities.

(Pages 22–24 of ICT in Inclusive Education – a document published by the European Agency for Special Needs and Inclusive Education.)

3 Information and Communication Technology in Practice

Information and communication technology (ICT) has facilitated unbelievable progress in education since the end of the 20th century. It has brought new technologies and user possibilities for sharing information and communication among people, and these possibilities overcome the time barrier and spatial limitations. This 21st century is, therefore, justly referred to as the century of information technology and our society as the global information society.

Considering the new trends, people should be prepared for life in the new millennium — for the active and creative use of new ICTs that will not only improve the lives of individuals but also increase the prosperity of the whole society. The information society is associated with the creation of more jobs based on the provision of services and information and with the development of knowledge as a source of wealth and power. Economic growth and competitiveness of countries depend on the culture and literacy of their people; that is why education should be the primary focus of our attention. This applies not only to children's and young people's education but also to lifelong learning.

3.1 From the History of Information and Communication Technologies

The development of information and communication technologies began with the invention of the telephone by *Alexander Graham Bell* in 1875, which laid the foundations for creating a cable-based communication network. This telephone network initially covered the American region only, but it gradually started to develop and extended to the Transatlantic area. Eventually, it became a global communication tool covering almost the entire world.

In 1910–1920, wireless communication network technology started to emerge, manifested in the first AM radio broadcasting. This wireless voice communication was further developed into audio-visual communication, manifested in a television invented around 1940. The peak was reached in 1943 when the first electronic computer was created, a device increasingly used in ICT applications worldwide.

The ICT abbreviation has become a natural part of our language. Not very long ago, as stated by A. Halašková (2004, p. 128 – 129), we were only using IT, standing for Information Technology. But with inventing the latest communication technologies, i.e., the internet, mobile phones and communication satellites, the letter C was inserted between I and T. ICT stands for Information and Communication Technology, the tools used in a variety of ways to support studies, other educational activities as well as data processing and transfer.

Fig. 1 Development of information and communication technologies

As further stated by A. Halašková, ICT includes:

- Traditional media, such as television, video projectors and radio;
- Personal computers with multimedia support;
- Input and output devices, devices for digitalisation, scanning, control and measurements;
- Internet and internet services;
- Integrated educational programmes (complex computer learning environments);
- Technology for videoconferences;
- E-mail;
- Electronic and programmable toys; and
- Automatic detectors, recorders and devices for automatic data evaluation.

According to J. Kolejnička (1997, p. 21), ICT is a system of methods, programs, procedures, and activities that facilitate maximum utilisation of near and distant information sources employing a wide range of information media, or the creation of such sources, through communication in computer networks to find optimal solutions to given problems and tasks, or fulfil one's intentions, or satisfy one's own needs. Information technology (IT) represents one of 12 pillars of the National Scholarship Programme of the Slovak Republic, Millennium project, for the next 15 to 20 years. In the Millennium project, the IT pillar represents connecting all schools to the internet and training all teachers to use it. Also, one of the project goals was to ensure all students could work with the Internet when they finished their studies.

3.2 Preconditions for using ICT in education

According to V. Stoffova and L. Kis-Tóth (1998, p. 150), the critical preconditions for using ICT in education include:
- Learning how to work with Windows operational system;
- Processing texts and tables in Word and Excel programs;
- Learning how to work with the internet and electronic mail;
- Presentation of schools via the Internet;
- Learning how to work with scanners and printers;
- Using multimedia CDs in a teaching process;
- ICT applications in study subjects.

According to E. Petlák (1997, p. 8), modernisation of education does not mean only changing the teaching methods and forms or any other arrangements or equipment in schools but also changing the work style in general while emphasising encouraging creativity and independence of learners. Some of the possibilities for the creative use of ICT were also pointed out by I. Turek (2002), for example:
- Searching values, data and information;
- Making regular calculations;
- Revising the obtained knowledge, developing skills and habits;
- Presenting information and study topics; modelling and simulations;
- Control of the teaching and learning processes; learning by solving problems;
- Diagnostics of students;
- Teaching through programs;
- Teaching through assigning projects; and others.

Other ICT advantages include:
- High degree of motivation;
- Making hard-to-access situations accessible;
- Exclusion of dangerous situations;
- Simulation of time-consuming events in a relatively short period;
- Interactivity—students may directly interfere and change conditions;
- Promoting creativity.

Information and communication technologies also improve productivity and attractivity of the learning process; this brings the following positive consequences:
In situations like this, students ask more.
- ICT makes searching for information more accessible.
- Students have more courage to take risks since ICTs are more flexible and provide an option to return.

- They use more prosperous and more varied sources and more media.
- Students have higher motivation as they can find the latest information in the ICT environment.
- They may design, create and use data control, collection and measuring systems.
- Students communicate and cooperate more.

In today's knowledge society, access to adequate ICTs should be regarded as an issue related to human rights. ICT is regarded as an integral part of many aspects of life at various political levels — in the European Union, the World Summit on Information Society, and the UN. Above all, it is an essential tool for supporting broader social inclusion. When efficiently used, ICT facilitates inclusive education in individual schools and all educational institutions and promotes supporting them as academic communities. ICT has the potential to strengthen respect for diversity as a step towards education across all communities.

Access to ICT, which supports inclusion, requires fully accessible, available, and affordable technology and access to adequately adjusted and accessible learning materials that provide equal learning opportunities to all students. Digital exclusion is a complex problem affecting education experiences and broader social experiences of populations much more expansive than just people with mental impairments or special educational needs. Access to and support of accessible technologies, conventional and assistive, that reduce digital exclusion require a systematic approach to politics and practice with the participation of all relevant stakeholders.

4   Conclusion

On 15 March 2017, the Ministry of Education, Science, Research and Sport of the SR published the National Scholarship Programme of the Slovak Republic, "Learning Slovakia" which has laid the foundations for the execution of a substantial reform of the education system. The document was prepared by a team of experts based on regional and higher education needs. However, the transformation of the education system requires a transition of education philosophy from the directive one to the creative and human one; it must focus on individual personalities and the general development of students. However, the great reform of the education system is currently unfeasible. Experts recommend evaluating and completing it first and then addressing the required political support.

At present, the information and communication technology is part of our everyday life. It affects many aspects of society, including education, vocational preparation, and employment. Above all, it has become a precious tool facilitating distance education of students during the pandemic and of people with health impairments and special needs. This article deals with information and communication technology concerning improving quality of life and reducing social inclusion. It is internationally recognised.

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