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UNDERSTANDING THE EFFECT OF E-LEARNING, THE ROLE OF DIGITAL LITERACY

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Abstract

Nowadays we often encounter the view that the current society is increasingly based on information work. However, the company, which is based on the penetration of information communication technologies and information into all areas of social life, is called an information society. In this society, all aspects of life (technology, social, economics, and politics) depend on access to information. It is, therefore, natural that new demands are constantly being put on education in the information society. The current trend in pupil education and education is the requirement for the pedagogue's ability to work effectively with information and lead to his / her pupils. In order to be able to survive in an informational society, it is necessary to emphasize digital and information literacy and the associated modern educational process. Information and communication technologies have an irreplaceable place in the educational process since their inception. Paper is focused on the definition of the pedagogue's tasks in the use of information and communication technologies as well as the characteristics of digital competences.

Keywords: *digital literacy, e-learning, information communication technologies*

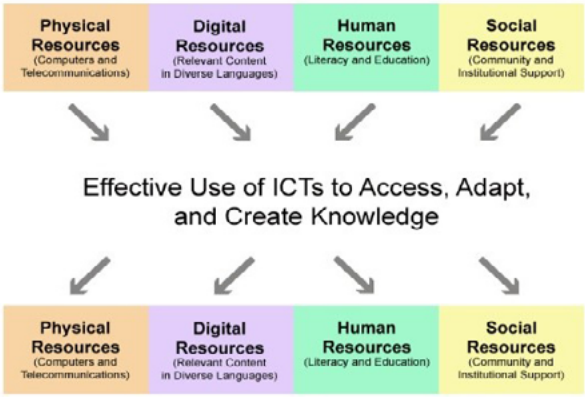
JEL Classification: *C83, J20, J22*

1 Introduction

The term information and communication technologies (ICT) means information resources such as the Internet, educational applications and various multimedia and hypermedia elements that are used in the educational process. These technologies work on all senses (Binkley. 2010), (Gottesman, 2000). Thanks to their new capabilities, they have an important role to play in acquiring knowledge and information and managing the cognitive process. ICT has become an important driving force in everyday life and economic activity. Most people in Europe today use a personal computer for various purposes, especially for the younger generation, the use of a computer is common every day. The integration of personal computers into education responds to these trends (Knuth, 1996). Using of ICT is needed in the context of the needs of modern didactics of informatics to develop and explore the computer literacy competencies (Záhorec et al., 2014).Successful use of personal computers in education depends not only on their availability but also on user knowledge. This also applies to access to the computer network of the Internet (Rieber, 2004).

ICT provides different kinds of tools that give new opportunities for classroom education. In particular, they make it possible to adapt the educational process to the individual needs of pupils and also provide the user with the important digital competences needed in our knowledge society. Pupils have to acquire a great deal of information, and therefore puts society in increased demands on the quality and quality of learning technology (Blaho, 2010), (Brdička, 2003), (Mikulecká, 2009). It is generally assumed that ICT has a positive impact on learning (Figure 1). The benefits go beyond the use of computers and the Internet. It also includes the use of technologies other than digital cameras and mobile phones that can support pupil education and personal development. Currently, the theory of constructivism is the most embedded in teaching ICT (Pound, 2005). Nair (2009) and Byron (2008) report that pupils and students are coming into a class with some experience and based on them with cognitive structures.

Figure 1 **Effective use of ICT in the educational process**



Source: Tapscott, 2009.

These changes, transformed under the influence of new experiments, so that these experiences, respectively. Information incorporated, integrated into existing structures (Chittaro et al., 2007), (Šilerová et al., 2017). This structural link between new and old information, as well as the various ways of processing the acquired information and the thought-based activity derived from them, new knowledge and conclusions are from the point of view of the learning active constructing process, which is a prerequisite for meaningful learning (ISTE, 2007), (Kluge et al., 2008).

2 Data and Methods

During pedagogical research we used the following research methods: Preparation for scientific research activity, study of domestic and foreign literature. By classifying and registering, we have been leaning on mediated facts and knowledge published in books and magazines and written documents. Methods of obtaining new data on the pedagogical process based on methods of measuring object situations - observation, experiment and methods of data acquisition through subjective statements - interview, questionnaire, knowledge test. Methods of processing obtained data - quantitative (statistical) and qualitative (method of logical analysis and synthesis, method of comparison). The basis of the educational methods and tools used was the fulfillment of individual basic didactic principles of education. The main objective of the research is to contribute to the clarification of some aspects of the topic being processed, to point out the complexity of

the issue of deploying multimedia information and communication technologies in the educational process, and to try to highlight the didactic efficiency in their use as well as the need for a comprehensive and interdisciplinary approach to such a solution in the educational area. The main objective of our research was to verify the degree of dependence between the effectiveness of learning through e-learning and the computer literacy of students. To achieve the main goal, we set partial goals:

- definition of theoretical backgrounds,
- verification of digital literacy of students,
- implement education through e-learning,
- evaluate results.

We formulated the following hypotheses:

Digital less literate students will need more time to acquire sufficient knowledge, skills and the ability to use the e-learning course itself. Digital literate students are aware of the benefits of learning through e-learning, which raises their interest in learning in this form.

3 Results and Discussion

To obtain, process, and evaluate data, we used a study of literary sources that we conducted during the period before the research began to better focus on the subject. In the research work, we used pedagogical observation by observing students during the educational activity during the experimental period. For the analysis of quantitative indicators, we used the basic statistical breakdown. We used the following mathematical and statistical characteristics to process and evaluate the obtained data. We used other analysis methods, analysis, synthesis, inductive and deductive procedures. We have evaluated and processed the facts obtained with the help of research methods in tables and graphs and interpreted them.

In order to achieve the required degree of objectivity of the obtained and processed results we used a didactic test with a control function. The test tasks were selected as the most appropriate on the basis of the consultation during the preparatory period of the experiment. The information obtained by the didactic test was preconditioned to meet the requirement of validity, reliability and practicality of the didactic tests. The didactic test was applied to content valid (valid, appropriate) and included test assignments, covering and comprehending the curriculum that was taught. The degree of reliability, ie accuracy and reliability, is commonly influenced by several factors. A certain measurement error will always occur and cannot be removed. The results are influenced by fatigue, student inattention, estimation, and the like. The practice of didactic tests as their further

characteristic was that they provided adequate and reliable information in a relatively short time from a large number of pupils in a way that allows comparability of the results. We used test assignments to match test and answer choice tasks. Assignment Testing Tasks: It was about assigning elements of the course to identify (recognizing), assigning relationships between concepts and properties. Responses choosing answers to assessing and selecting knowledge and relationships with the use of tasks with multiple correct responses. The results of the pedagogical experiment were processed in terms of both quantitative and qualitative analysis, on the basis of which we interpreted the results.

The experiment was preceded by careful coordination and alignment of the work of all the teachers who participated in it. The tasks and objectives of the experiment, as well as the agreed methods and protocols to achieve them, have been thoroughly developed. Given the unequal timing of the timetable, it was necessary to set a time span and a common test date.

E-learning not only consists of textbooks placed in AIS, but also from external sources and unmanaged self-study, including searching for information outside the provided sources. Pre-it was not possible to monitor all student activities within e-learning. However, it is not possible to obtain reliable data, since opening the course for some time does not mean that the student spends all of his time intensively on e-learning only. The maximum number of points in the entire test that the pupils of both groups could receive was 55 points. The total mean result of the experimental group was 44.62 points. The overall average score for the control group was 31.22 points. The distribution of the values of both cases was Gaussian - normally the most common in nature occurring. Two-sample t-test confirmed that the mean value of experimental group 44.62 was statistically significantly higher than the mean value of control group 31.22 ($p = 0.000$). The homogeneity of the sets was the same - the odd-to-tweak scores of 2.31 and 2.20 did not differ statistically significantly, the difference between the worst and the best in both groups was the same, homogeneity ($p = 0.432$).

The maximum number of points you could get when answering Task 1 was 2 points. In the experimental group, the total score of 1.14 scores was statistically significantly greater than the mean score in the control group of 0.25 ($p = 0.000$). Also, the variability of the score values achieved in both groups differed statistically significantly. The benchmark of the evaluation of the experimental group 0.72 was statistically significantly lower, the standard deviation in the control group was 1.03 ($p = 0.002$). We can say that the experimental group was more successful, the differences between the individual pupils in the experimental group were smaller than in the control group.

The maximum number of points that could be obtained for the answers to task 2 was 1 point. In the experimental group, the total mean score of 0.8 was statistically significantly greater than the mean score achieved in the control group of 0.21. The variability measured by the standard deviation in the experimental group of 0.60 and the control group 0.71 did not statistically significantly differ. The experimental group was more successful, but the knowledge was more homogeneous, the homogeneity of knowledge in both groups was at the same level.

Table 1 **Statistical evaluation of the experimental and control file at question 1**

	Average	Average	T-test	Degrees of freedom	Significance level
	A	B			
Q1	1,14	0,25	6,27	177	0,000

Standard variation	Standard variation	F-test	Significance level
A	B		
0,72	1,03	1,92	0,002

Table 2 **Statistical evaluation of the experimental and control file at question 2**

	Average	Average	T-test	Degrees of freedom	Significance level
	A	B			
Q2	0,8	0,21	6,33	178	0,000

Standard variation	Standard variation	F-test	Significance level
A	B		
0,60	0,71	1,40	0,113

The maximum number of points you could get in the answers to task 3 was 2 points. In the experimental group, the overall mean score reached 1.26, which is statistically significantly higher than the mean score achieved in the control group of 0.89. The variability measured by the standard deviation in experimental group 1.22 of control group 1.16 was the same. In the experimental group, the overall average score was 1.26, which is statistically significantly greater than the mean score achieved in the control group of 0.89. The variability measured by the standard deviation in experimental group 1.22 of control group 1.16 was the same. The experimental group was statistically more successful than the control group, but

the knowledge was more homogeneous, the homogeneity of the veins in both groups was at the same level.

4 Conclusion

Digital technologies as a technical means of educational process attract pupils through their architecture and functionality. With high-quality educational software, it contributes to greater focus and keeps pupils' attention by constantly communicating with the user. The ability to immediately verify your own interests, to use your own imagination and logic is a powerful motivation tool for working with your PC. Through its interactivity, communicativeness, objectivity and discretion, it motivates pupils. The multimedial education software at the level of interactions acts to increase the level of concentration and attention. It can greatly help in learning what cannot be shown or represented better by other didactic means. The results of our pedagogical experiment have shown that the way we touched the subject of Technical Education using appropriately selected digital technologies was appropriate. Pupils appreciated the quality of study and work materials that were used for teaching and very much appreciated the way they were used. Teachers have sincerely stated that they had some concerns at first, but appreciated themselves with the help of modern technologies to "discover" new dimensions of education. Using a suitable methodology, teachers of all ages are able to work with digital technologies and know how to apply them to any subject. Digital technology needs to be implemented in the education of all subjects, so it will be necessary to gradually change the relationship between the teachers of informatics teachers and the teachers of other subjects need to come together, help and jointly implement the strategy of transforming a traditional school into a new modern school - the modern information and communication technologies of education. It is always necessary to look for new optimal opportunities for digital technology at school for the widest range of teachers and pupils. Nowadays it is not enough to have personal computers connected to the Internet centered in a special classroom, it is necessary to implement modern technologies gradually into vocational training, in laboratories, to create a special room for teachers.

Digital technologies open up new dimensions of education that bring changes not only to the content of education, but also require the application of new methods and forms of learning, building a new teacher-pupil relationship, greater responsibility and more active pupil access to education. The implementation of the transformation of education for the needs of education requires a legislative adjustment of the necessity and the need for further teacher education in the field of introduction and use of ICT in teaching, creating a new concept of career

progression of the teacher, developing new forms of lifelong teacher education, obtaining certificates.

The cause of the expansion of the didactic triangle, the fourth component of didactic means, was the increasing importance of modern didactic aids in the teaching process. Under the influence of the transfer of modern didactic technology, especially computers, the teacher's position in teaching is changing. Modern digital technologies create a new situation for the pupil as well, as it changes his learning conditions, creating a new sensorimotor space for receiving and processing information. On the one hand, pupil communication enriches, refines and intensifies, but, on the other hand, it degrades social contacts. The teacher must therefore choose such a teaching strategy in order to achieve optimal results. The pupil is at the forefront of perception, preservation and use of knowledge, their creative application, active co-operation with teachers and other pupils, self-supervision and independent study.

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