# PEDAGOGY STUDENTS ABILITY TO USE ICT IN THEIR TEA

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### Abstract

From the invention of the first computers to the latest smart devices, technology is evolving at lightning speed day by day. The new era of computers has changed the entire process and the way young people learn and educate themself in this modern world of digital society. Accordingly, within the study program of the Institute of Pedagogy a new subject was introduced *ICT in teaching*, whose realization gives students digital literacy, necessary for the use of ICT in the teaching process.

Therefore, the main objective of this research is to see the extent to which students are trained to use various ICT tools aimed at implementation of modern teaching. The level of ability of students to use various ICT tools in this case is discussed in terms of the views and opinions of students using a scale of evaluation (self-evaluation) and test of acquired skills to use certain ICT tools within teachings. The survey includes all students who attended the subject ICT teaching in the last three academic years.

The results of the survey show that students acquired the necessary skills to successfully practice different ICT tools in the teaching process.

**Key words:** *ICT, teaching, initial education, digital literacy.*

### Introduction

Education can be fun for those who consume and those that offer it as a service. Educators should not search for the secret formula to convert educational content in an attractive and interactive for students, but only to accept as indisputable fact that kids like technology. Through it actually, they learn interactive language that has opened the door to virtual world today. Their virtual world is also filled and rich in essential and innovative challenges in harmony with nature and vision of modern living. It is essential to maintain competitiveness in the global economy and leadership of each country in its region is digital literacy of youth, as a central labor.

The text that follows this study, the authors will offer interpretation of "digital literacy" and overview of Information and Communication Technology in the Republic Macedonia conducted training for digital literacy of teachers in R. Macedonia. There follows a description of the organization and course of research showing the results as part of the review and synthesis of findings from self-evaluation of the IV year students at Skopje University, Faculty of Philosophy, Department of Pedagogy, Skopje, Macedonia.

### Digital Literacy

Consequently changes in the age of technology and communication, the notion of digital literacy is a fluid and a relative concept, which is essential for future citizens of our modern society. Many authors believe that the need to expand the traditional definition of literacy beyond reading and writing, because language is the only system of communication in today's world. In fact there is no better example of a new form of communication media with greater importance than the social networks.

Some authors, the concept and importance of digital literacy, defined as *"script that basically is the ability to read, but is currently used in an extended social context*."[30] The word literacy gradually spread to other areas. The word literacy gradually spread to other areas.

Other scientists broadly defined the term, for example, some digital skills are divided into six categories. The first two categories were associated with medium or operational capabilities needed to manage digital media.

The following four categories of skills were associated with content: skills for searching and evaluating information, communication skills, strategic skills to achieve professional and personal goals and skills to create content..[31] Tiner indicated that there is a difference between "*writing tools*" and "*literacy presentation*" or loosely translated, what he calls "*compounds the instrumental aspects of technology*," or set of skills using a variety of digital tools. [32]

More recently digital literacy is identified with the term "*digital competence",* [33] *,* which in the society is the modern way of living. Many discussions can be found in the analysis of various scientific journals and papers for interpretation of digital literacy..[34] In the last decade it is the only one of the new forms of contemporary writing.

Prominent professors from the teacher training colleges around the world, often in public discussions, say it is enough to use different devices and social networks, but it is necessary "information to be turned into knowledge*"*[35].

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[30] Tyner, K., (1998). Literacy in a digital world: *Teaching and learning in the age of information.* Mahwah, N.J.:Lawrence Erlbaum, pp.153-166

[31] Johannesen, M., Øgrim, Л., Giæver, T, H., (2014) *Notion in Motion: Teachers' Digital Competence, Nordic Journal of Digital Literacy,*300-312
https://www.idunn.no/dk/2014/04/notion_in_motion_teachersdigital_competence_

[32] Johannesen, M., Øgrim, Л., Giæver, T, H., (2014) *Notion in Motion: Teachers' Digital Competence, Nordic Journal of Digital Literacy,*300-312
https://www.idunn.no/dk/2014/04/notion_in_motion_teachersdigital_competence_

[33] More details: DIGCOMP: A Framework for Developing and Understanding Digital Competence in Europe2013

[34] Ilomäki, L., Kantosalo, A., & Lakkala, M. (2011). What is digital competence?
http://linked.eun.org/web/guest/in-depth3

[35]Marc Prensky, (2001) "Digital Natives, Digital Immigrants Part 1", On the Horizon, Vol. 9 Iss: 5, pp.1 - 6

According to the draft program for the development of ICT in education (2005-2015), which is part of the National Program for Development of Education in Macedonia 2005-2015, modern education allows students to gain two types of information literacy, first literacy relates to ICT knowledge and the second script referred to "a person's ability to increase its own efficiency and productivity at work using ICT technologies.“ [36].

We can summarize that analyzed according to several studies, the term digital literacy means, knowledge and skill to use a wide range of digital devices, computers, tablets, mobile, etc., technical and information retrieval, key, critical appreciation, individually creating and presenting own creations by sharing them on the internet. In a broader sense it is a skill to co-operate in safe environments, Bon-Ton in the presentation of innovative creations in order to be used globally.

Pedagogy, as science, intensivelye is getting into newer digital ecosystems and safe educational environments, it is more critical importance that is more rapidly develop digital literacy that affected the future educators and teachers.

### Information and Communication Technology in the Republic Macedonia

The intensive development of information and communication technologies (ICT) in the world led us to change the existing society in all spheres. Our experts recognizing the long-term benefits of high quality and modern education system as a strategic priority determined the investment in education as the most reliable way to create strong individuals in the National Strategy, the Strategy for Development of **e-** -content.[37]

The Program for the development of ICT in education (2005-2015) is part of the National Program for the Development of Education in the Republic of Macedonia (2005-2015), referring to the specific use of ICT in education. The vision of this draft program for the development of ICT in education for 2005-2015 consists of the digital literacy of the entire teaching staff to use ICT in the teaching process, digital literacy of students, connected schools with a fast Internet connection and multimedia computers, services support and development of educational multimedia content on the mother language.

In the past schools passed through the historical process of changing their ICT preparedness, which was a reflection of broader social integration of ICT and according to the strategy it should lead to the creation of a modern digital society and a modern economy. In this regard they were planned series of interconnected and interdependent initiatives which together led to the modernization of the educational process and improve the quality of education..[38]

### Trainings for digital literacy for the teachers in R. Macedonia

Effective integration of ICT in teaching, in our region, according to the National Strategy for Development of Information Society and Action Plan[39], is implemented in 7 priority pillars

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[36]More details: http://www.mio.gov.mk/files/pdf/dokumenti/strategija_e-sodrzini_2.pdf стр.4

[37] (**е–** ) буквата во продолжение на тектстот е скратеницата и го заменува зборот електронско/а, и ќе се употребува за електронски содржини, електронско образование и т.н.

[38]More details: http://www.mio.gov.mk/files/pdf/dokumenti/strategija_e-sodrzini_2.pdf

[39] More details: http://www.mio.gov.mk/files/pdf/dokumenti/Strategija_i_Akcionen_Plan.pdf

(Infrastructure, E-business, e-government, e-education, e-health, e- citizens, Legislation), with multiple project activities. Digital culture among all citizens realizes the type of device and the level of developed skill to use them. A series of trainings for teachers in primary and secondary schools for basic ICT skills, training and integration of specific software solutions in interactive teaching "e School (School e)" (2003-2008), "Macedonia Connects" (2004- 2007), and later "primary education project (PEP education) '(2006-2011).

These projects provide continued support for digital literacy of teachers. Basic digital literacy skills begins with using Windows tools, educational software ToolKid (TulKid), training for development of web pages (Mambo) and the use of Internet search, collaboration and communication. The use of ICT in teaching and is covered by the project "Modernization of Education" (2004-2009), the program of the Ministry of Education and Science of the educational process. "Computer for Every Child" begins in late 2006, and is based on the National Program for the Development of Education (2005-2015). Within this project we realized trainings for using Edubuntu (localized educational software) for teachers in primary and secondary schools.[40]

Depending on computer skills, willingness and motivation, teachers engage in many other projects such as training in using the robot Pippin, training for educational software GCOMPRIS, good teaching practices (Movie Maker), training for recording instructional practices ( Kino, PiTiVi, Movie Maker), courses on the use of Smart Boards, etc. Current projects using ICT in teaching USAID in the implementation of the "Step by Step" started 2014 / 15g., Audio and digital picture books, Showcase Classroom Macedonia 2015/16 etc.

According to the same standards for teachers, it requires fluency in technology systems and the transfer of current knowledge, new technologies and situations. When it is necessary to cooperate teachers with students, to colleagues, parents, and community members using digital tools and resources to support the success of students and their innovations. At the same time, they need to effectively communicate relevant information and ideas to students, parents and colleagues using different media and formats of the digital era, to model and support effective use of current and digital tools emerging to locate, analyze, evaluate, and use information resources to support the process of research and learning..[41] Author Dominique Petko, in his study of integrating model of constructivist guidance for teachers, found 357 high school teachers in Switzerland, positive correlations between "will, skill and tools," [42] coupled with the frequency and diversity of the use of ICT in teaching. According to Watson, "the actual implementation of technology in education requires changes in the style of teaching, but also changes in the approach to learning and access to information."[43] Indisputable is the fact that ICT is required for all future jobs, and students today are better prepared digitally by a number of teachers and therefore they do not want to study the way that their parents did 30 to 50 years ago. According to the information above, the Strategy for the development of e-content, referred the following 5 sections: supporting and encouraging learning and creativity of the students in the digital age; design, development experiences and assessments of learning in the digital age;

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[40] More details: http://mio.gov.mk/?q=node/2247

[41] More details: http://www.iste.org/standards/standards/standards-for-teachers

[42] **Dominik, P.,** *Teachers' pedagogical beliefs and their use of digital media in classrooms: Sharpening the focus of the 'will, skill, tool' model and integrating teachers' constructivist orientations,* Computers & Education**, Volume 58, Issue 4, May 2012, Pages 1351–1359

[43] Watson, D.M.: Pedagogy before Technology: Re-thinking the Relationship between ICT and Teaching. In: Education and Information Technologies, vol.6, iss. 4, pp. 251-266 (2001)

model of working and learning in the digital age; promoting model digital citizenship and responsibility, and participation in professional development and leadership in the digital era. [44].

### Subject and research method

In recent years our country, emphasis is given to the digital literacy and creative use of ICT in teaching. Consequently with these flows, the Institute of Pedagogy at the Faculty of Philosophy study program some years ago introduced an optional subject ICT in teaching. In this study, includes all students who attended the teaching of the subjects in teaching ICT in the last three academic years.

The subject of this research is assessing the digital literacy of students from the Institute of Pedagogy, with the main objective to perceive ability of students to use various ICT tools aimed at implementation of modern teaching. The basic assumption is that students have acquired the necessary skills to successfully practice different ICT tools in the teaching process.

The initial information received by analyzing the current literature on modern digital literacy of teachers and application of ICT in the curriculum, review the chronology of events related to the digitization of education in the country. Then we analyzed the views and opinions of students before starting every hour on the subject ICT in teaching. We used a scale of evaluation (self-evaluation) and asked various questions that they indicate the level of competence in using various ICT tools. Students determine the level of developed skills to work with programs for word processing, presentation creation, spreadsheet package and is educational - resources at the beginning of classes.

Then followed the activities of the subject ICT in teaching, exercises and assignments in which students actually practiced separate tools. At the end of each hour, once converted content for teaching and designing models for presentation in teaching using different tools, they again self-evaluate with the same tool and completely identical issues. The obtained empirical data are statistically processed with appropriate procedures for quantitative and qualitative analysis.

### Research Results

As significant data analysis in the research, we are appreciated ability of respondents to use the basic packages for computer work. Not interested in the level of developed skills of application expertise and willingness to actively use text package, package for presentation and spreadsheet package. Respondents with the scale of assessment for self-evaluation indicate the level of developed skills before starting with practical exercises on the subject ICT in teaching and then eventually realized the practical activities again indicate their opinions. Distribution of their views on the level of developed skills to use text package present in Table 1

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[44] More details: http://mio.gov.mk/?q=node/2247

**Table 1.** *Opinions and attitudes about the level of developed skills of application expertise and willingness to actively use text package in Teaching*

| Categories of responses: | | before | | after | |
|---|---|---|---|---|---|
| | | *f* | *%* | *f* | *%* |
| 1. | *Dissatisfied F* | 2 | 2,63 | 2 | 2,63 |
| 2. | *Sufficient  D* | 4 | 5,26 | 24 | 31,58 |
| 3. | *Good  C* | 15 | 19,74 | 36 | 47,37 |
| 4. | *Very  good B* | 31 | 40,79 | 11 | 14,47 |
| 5. | *Excellent A* | 24 | 31,58 | 3 | 3,95 |
| | *Total* | *76* | 100,00 | *76* | 100,00 |

| $x^2 = 48{,}792$ | df=4 | $p < 0.01$ |
|---|---|---|

From the above statistics show that 31,58% of respondents in the category before samoevaluirale excellent, but then in the category after completing the class, participants Self-Evaluation as excellent 3.95%. 40.79% of respondents in the category before s Self-Evaluation with many others. good, 14.47% thereafter. 19, 74% of respondents in the category before Self-Evaluation good, 47.37% thereafter. 5.26% of respondents in the category before Self-Evaluation sufficient, 31,58% thereafter. According to these data we conclude that there is a significant difference in the degree of self-assessment developed skills to use text package before then. The resulting value of the chi-square test is statistically significant and shows that there is a difference between before and after the category. The analysis of the use of the word packet before and then not interested because after realization of practical exercises, the students develop awareness and reflection about their own level of skill in using text package necessary to use certain tools in the teaching process. According to the processed data it can be concluded that despite the difference in opinion expressed by the respondents to the level of developed skills to use text package in teaching before and after the implementation of the lectures, the students have acquired a sufficient degree of digital literacy.

Cherished opinion that it is important for students to the level of developed skills to use the package for presentation in teaching. Distribute their attitudes are present in Table 2.

**Table 2.** *Opinions and attitudes about the level of developed skills of application expertise and willingness to actively use the package for presentation in teaching*

| Categories of responses: | | before | | after | |
|---|---|---|---|---|---|
| | | *f* | *%* | *f* | *%* |
| 1. | *Dissatisfied F* | 0 | 0,00 | 0 | 0,00 |
| 2. | *Sufficient  D* | 1 | 1,32 | 13 | 17,10 |
| 3. | *Good  C* | 2 | 2,63 | 53 | 69,74 |
| 4. | *Very  good B* | 19 | 25,00 | 9 | 11,84 |
| 5. | *Excellent A* | 54 | 71,05 | 1 | 1,32 |
| | *Total* | 76 | 100,00 | 76 | 100,00 |

| $x^2 = 112{,}220$ | df=3 | $p < 0.01$ |
|---|---|---|

According to these data, it shows that 1 respondent category before, thinks that enough packages used for the presentation, then 13 respondents. Two respondents in the category before Self-Evaluation good, and 53 thereafter. 19 respondents in the category before Self-Evaluation with many others. Good, then 9. 54 respondents in the category before Self-Evaluation excellent 1 thereafter. From these data and the resulting value of the chi-square test, it can conclude that there is a significant difference in the opinion expressed by the students of the degree of developed skills to use package for presentation in teaching, before and after the implementation

of teaching hours. These data also show that students with implementation of ICT teaching hours in teaching have acquired a sufficient degree of digital literacy and skills to use the package for presentation in class.

Interested to learn of and the level of developed skills in students using the spreadsheet package for the needs of teaching. Respondents with the scale of assessment for self-evaluation, the estimated level of developed skills before starting with practical exercises on the subject ICT in teaching and then eventually realized the practical activities, again Istatov scale of assessment. The data obtained from the assessment of the degree of developed skills to apply spreadsheet package are shown in Table 3.

**Table 3.** *Opinions and attitudes about the level of developed skills of application expertise and willingness to actively use a spreadsheet package instruction:*

| Categories of responses: | | before | | after | |
|---|---|---|---|---|---|
| | | f | % | f | % |
| 1. | *Dissatisfied F* | 4 | 5,26 | 3 | 3,95 |
| 2. | *Sufficient  D* | 7 | 9,21 | 17 | 22,37 |
| 3. | *Good  C* | 15 | 19,74 | 39 | 51,32 |
| 4. | *Very  good B* | 32 | 42,11 | 9 | 11,84 |
| 5. | *Excellent A* | 18 | 23,68 | 8 | 10,52 |
| | *Total* | 76 | 100,00 | 76 | 100,00 |

| $x^2 = 31,722$ | df=4 | $p < 0.01$ |
|---|---|---|

According to these data, shows four respondents in the category before self-evaluation dissatisfied with the assessment, but 3 participants afterwards. 7 participants before expressed the view that not enough use a spreadsheet package, and 17 respondents afterwards. 15 respondents in the category before self-evaluation good, and 39 thereafter. 32 respondents in the category before self-evaluation with many others. good, then 9. 18 respondents in the category before self-evaluation excellent and 8 afterwards. Under its data and value of chi-square test, it can conclude that there is a difference in opinion expressed by the respondents' level of skills developed using a spreadsheet package instruction before and after the implementation of teaching hours.

According to these results it can be concluded that students acquired sufficient level of digital literacy and skills of using a spreadsheet package in teaching.

The obtained data shared with students inspired discussion of the reasons for the changes and differences in self-evaluation before and after, "why" changed their attitude. In fact, they believed that a high level of skills in using office packages as often used in the studies. But over the lessons with practical tasks and activities, they became aware of "how much more can learn" how to creatively use the same teaching, so the category then, self-evaluation in a lower grade.

Especially we were interested in the views and opinions of students regarding the use of educational software and educational e - teaching resources. We have set up an open question "Please use several e - educational resources." According to the analysis of the answers before the practical exercises, a total of 76 respondents, 54 listed office suites, and 22 respondents did not answer. Then he realized the practical activities, respondents cite: Tulkid (ToolKid), GCompris,[45], WebQuest[46], ABC tools, (abctools)[47], IXL.com,　Tellagami,[48] and Open

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[45]More details:　http://gcompris.net/index-en.html

[46] More details: http://webquest.org/

[47] More details: http://www.abcteach.com/abctools_home.php

[48] More details: https://tellagami.com/edu/

Educational Resources (OER)[49], which enriched their knowledge and skills to use the growing number of digital educational resources for the classroom.


### Conclusion

From the analysis of empirical data obtained by the survey we concluded that it confirms the hypothesis that pedagogy students acquired the necessary skills to successfully practice different ICT tools in teaching process.

The data obtained from the analysis made it possible to perform more important general conclusions about the level of digital literacy and creative use of ICT tools in teaching process. Students of the Institute of Pedagogy develop abilities and skills in using office suites in teaching and educational resources as sufficient level of digital literacy.

The speed with which developing tools and educational software can not follow the same pace, but of course we need a certain level of digital skills that students develop by the end of initial education. Their ability to use various ICT tools, aimed at realization of modern education is an extremely important factor for the future generations of students. From the educational perspective, digital literacy does not only mean using ICT tools and communication for Internet surfing. Digital literacy involves teamwork safe social learning environments on the Internet.

The mission of this paper is to point out that the essential motivation of students for creativity in the realization of educational goals and monitoring the modern trends and challenges of the latest technology. Digital skills are still very important for every student, if the desire to succeed in the twenty-first century, in whatever area it focuses and develops.

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[49] More details: http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/open-educational-resources/

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