TEACHERS' COMPUTER AND INTERNET LITERACY

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Abstract Today, it is necessary for each individual to obtain the abilities of using modern computer techniques in order to lead an independent and creative professional and social life. The area of Teachers' Computer and Internet Literacy in Slovenia hasn't been researched much yet. We have come out of the research problem that despite fostering ICT and EU investment in digital literacy of teachers, they are still not enough qualified for the use of ICT. In this article we have written the results from a research of teachers' computer and internet Literacy. In theoretical part, we have presented the observation of different kinds of literacy in EU and initiatives to increase Computer and internet Literacy. In the empirical part of work, we have concentrated on the research of Computer and Internet Literacy of teachers at primary schools. In the survey that we have done among primary school teachers, we have compared the obtained data from the survey with Eurostat data. The analysed data was whit the programme for statistical analysis, statistically analysed. At the end of our work, we set guidelines for further research with a new method.

Keywords: computer and internet literacy, teachers', information and communication technology, Eurostat, Digcomp.

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1 Introduction

In the past, literacy meant only the ability of writing and reading. Over the years, the significance of this expression broadened. The definition of literacy is very vague, whereas the expression literacy itself is actually the ability of successful communication and socializing. (Cotič, Medved Udovič and Starc 2011, 9–11). Nowadays, literacy also means being familiar with computer science. The ability of using computer techniques is called Computer Literacy (Lee 1999, 137). The development of computer science later brought internet and its use. From that time on, we can talk about Internet Literacy (Bawden 2008, 23). Recently, another common expression has been used such as digital literacy (Carrington and Robinson 2009, 3–4). Today, it is necessary for each individual to obtain the abilities of using modern computer techniques in order to lead an independent and creative professional and social life (Grosman 2010, 16). The facts mentioned above, have encouraged the aims of digital agenda to seek and to be familiar with different types of literacy in European Union (EU) (European Commission 2010, 39), especially among teachers who later transmit their knowledge to younger generations. The area of Teachers' Computer and Internet Literacy in Slovenia hasn't been researched much yet. Consequently in our research we have analysed Computer and Internet Literacy of primary school teachers and set some guidelines for further researches.

2 Literature review

A Memorandum on Lifelong Learning (Commission of European Communities, 2000, 3) defines crucial skills needed for a good collaboration in the world of global knowledge. One of these skills is Information Literacy in connection with the use of Information and Communication Technology (ICT). Information Literacy, set in Lisbon, is defined as a basic skill, which is important for each individual to work successfully in modern world.

Nowadays there are several concepts defining abilities of using ICT- Computer Literacy, Internet Literacy, Digital Literacy and Information Literacy. With a detailed research we have found out that all the expressions have many elements in common, although in further discussion, we are going to use the concept of Computer and Internet Literacy, which define the abilities of an individual using computer, internet and the rest of ICT.

Despite the initial endeavours by the European Council for the Advancement of Computer and Internet Literacy in the EU member countries, the Ministry of Information Society of the Republic of Slovenia (RS) warned within the strategy already in 2003, that there was still very low level of general information literacy in some of the Slovenian regions. (Government of RS 2003, 23). Despite the warnings, there is data from the Statistical Office of the Republic of Slovenia (SORS) that the level of computer using and knowledge has increased recently and it is even more promising in the future. In the survey it is found out that 64% of population in the age group of 16- 74 years uses computer daily. (SORS, 2017). The use of internet is daily in progress by 74% of population in the age group 16- 74 (SORS 2019). The research of SORS has showed that the Internet Literacy is much higher among younger generations, whereas there is still deficit among the older ones (SORS 2017, 2019).

Deficit of modern technology information abilities among elderly and uneducated should be reduced as soon as possible regarding modern lifestyle of intensive computerisation in all aspects of life such as work, education etc. It is necessary to foster educational training of Computer and Internet Literacy, especially with those who are less familiar with this area. (Chaffey 2007, 185). Therefore, the main aim of digital agenda is encouraging Computer and Internet Literacy in European Union. It is important to know, that people with Computer and Internet illiteracy are expelling themselves from Information Society (European Commission 2010, 39), and consequently becoming uncompetitive in the field of Economics and society in general (European Commission 2007, 4). European Commission is supervising different testing indicators of achieving the aims of Information Society. Eurostat is in charge of statistics about the use of computer and internet. Computer and internet skills are included in the area of e-skills. When measuring computer and internet literacy, there are six computer and six internet skills counted. According to these criteria, people who master five or six skills, are classified as highly qualified, those who with three to four skills are average qualified and those with one or two skills belong to low qualified people. The rest, who have no competences of mentioned skills, are classified as illiterate in computer and internet science (Prav tam, 4). In Slovenia in 2014 there was an overall percentage of those who mastered any of computer skills lower (12%) comparing EU 28 (15%) (Eurostat 2014). Slovenian users (in 2013) are less qualified of using computer skills (28% familiar with one or more skills) than the other EU users (30%). (Eurostat 2013b). In 2017 Eurostat

gathered the last data about the Computer and Internet Literacy as well as the other uses of ICT. The last research has considered the recommendations of Digital Competences Framework for the inhabitants of European Union (DIGCOMP). Slovenia is still below the average according to the statistics, which shows lower digital literacy (24%) than the average of EU 28 (26%) (Eurostat 2017).

Therefore, Slovenia as a EU member, occupies low place on the EU level. This means that mastering new knowledge is also very important for a teacher. Teachers are those who encourage changes on the level of an individual and community (Muršak, Javrh and Kalin 2011, 7). This should represent a challenge for a teacher to gain new skills of Computer and Internet Literacy. On the other hand, beside regular work, it takes additional effort for a teacher to get educated in this field.

Fostering Computer and Internet Literacy among teachers already started in 1994 within the project Computer Literacy (CL). These were the first steps made towards computerisation and the use of ICT in educational system. Years later there hasn't been done anything important in this field. Teachers on their initiative participated in different ICT courses. There were some projects organized, but haven't reached the majority. In 2007, 2008 and in 2010 The Ministry of Education and Sport in Slovenia co-financed project called E-Materials. This project covered all school subjects. In 2008 project E- Education was created, which was meant to organise training for Computer and Internet Literacy and was in charge of ICT support in Slovenian schools. One of the aims of this project was to gain a teacher competent in computer skills. The seminars for teachers included six basic competences of Computer and Internet Literacy. [1] This project was integrated in Slovenian primary and secondary schools and it was finished in 2013. After that year there hasn't been much done much on encouraging Computer and Internet Literacy among teachers. The area of Computer and Internet Literacy in Slovenia hasn't been researched much yet. In 2011 The Faculty of Natural Sciences and Mathematics in Maribor (University of Slovenia) carried out a research on Trends and Conditions of using ICT in Slovenian primary and secondary schools, which mainly dealt with appropriate

[1] E-Competences: 1. Knowledge and ability to critically use ICT. 2. Ability to communicate and collaborate over the Internet. 3. Ability to search, collect, process, evaluate (critical judgment) data, information and concepts. 4. Compliance with legal principles for the use of information. 5. Creating, updating, and publishing e-materials. 6. Ability to design, implementation, evaluation of teaching using ICT.

equipment in schools. In the beginning of 2013 Slovenia began to carry out an international research about Computer and Information Literacy . International research ICILS 2013 (Pedagogical Institute 2014) lasted one year. The research included students of the eighth grade and the teachers taught in those classes. Teachers had less role in the survey compared to students, which obviously means, that the research was mostly oriented on students (Gerlič 2011).

3 Teacher Computer and Internet Literacy

Furthermore, we are presenting the analysis of Computer and Internet Literacy levels of teachers. We have come out of the research problem that despite fostering ICT and EU investment in digital literacy of teachers, they are still not enough qualified for the use of ICT.

3.1 Collected data

The research about Computer and Internet Literacy was done for primary school teachers. The data was collected with the use of classic survey, for we wanted to gather teachers who are less familiar with Computer and Internet Literacy. The survey was anonymous. The questionnaire was divided into seven parts. In the first part there were 12 questions regarding work with files, folders and computer operating system. The second part with 24 questions included the area of word processing software. The third part, which had 15 questions, included editing spreadsheets and the fourth part (9 questions) was connected with the questions of using software for managing electronic transparencies. The use of electronic mail and internet was included in the fifth part (9 questions). The six part was dealing with e-materials and programming (10 questions). In the last part we gathered some general data about the respondents. A large number of questions were close-ended which enabled us an accurate process of data. There were 150 teachers invited to participate in selected primary schools. During the survey we received 132 completely fulfilled questionnaires (88% feedback).

The completely fulfilled data was collected and exported in spreadsheet programme (Microsoft Excel), where it was analysed. The analysed data was exported in the programme for statistical analysis (SPSS), where it was statistically analysed.

Frequencies (fk) and proportions (fk%) were calculated for nominal and ordinal variables. Values (M) and standard deviations (SD) mean interval variables.

3.2 Analysis of the collected data

The average teacher in the survey is 40 years old, the youngest respondent is 24, whereas the oldest one is 58 years old. 95% of respondents were women, which is slightly more than it is usual for primary schools.

The highest percentage of teachers, who participated in the research, teach primary level classes (41,4 %) or carry out pedagogical progress in the first two triads. (1st to 6th grade). The rest of the respondents work in the third triad. (Table 1)

Table 1: Teachers by subjects

Variables	fk	fk (v %)
Socially-humanistic subjects	41	30,8
Natural-technical subjects	25	18,8
1st and 2nd Triad	55	41,4
Other	11	9
Total value	133	100

Source: own.

Computer and Internet Literacy was measured on a 3-point scale: 1- I can't, 2- I've already worked with it, but I forgot and 3- I can. The final dimension was calculated as an average evaluation of these elements.

The skills questions were included from the Eurostat research due to the comparison.

Crucial skills with files, folders, operation system, editing text and spreadsheets, the use of electronic mail and internet, carrying out e-materials, websites and programming were included in our research. Teachers from the survey completely master (over 70%) nine skills (Table 2).

Table 2: Selected e-skills in our research

Variables	M	SD
Use the copy / paste function to copy existing text in the text editor	3,0	0,3
Attach one or more files to an email message when working with email	3,0	0,3
Copy files to removable media	2,9	0,4
Search the web pages in search engines	2,8	0,6
Post a question in web forum or respond to a forum post	2,6	0,8
Archive the saved files in the file compression program	2,5	0,8
Establish or install a new device	2,5	0,8
Make an online call over internet	2,4	0,9
The spreadsheet program summarizes two cell data	2,2	0,9
Exchange files over peer-to-peer networks	1,3	0,8
Creating a simple website with an website builder program	1,1	0,4
Creating a program that sums two numbers and displays the result on the screen	1,1	0,3

Source: own.

The Eurostat data on computer skills (2014) for the year 2014 proves the fact that the proportion of all individuals in EU member countries 28, who master five to six computer skills, is lower than the one of our teachers surveyed. (Table 3). Eurostat classifies the users that master five to six computer skills among the highest qualified computer users. Those with three to four computer skills are placed among average skilled users. The proportion of teachers surveyed is higher than the one in EU 28. Lower qualified users can master one to two skills. The proportion between surveyed teachers and other EU 28 users is the same. There is a very low proportion of those teachers who are computer illiterate and it is also lower than the one of EU 28 countries.

Table 3: Computer skills of surveyed teachers

Variables	Teachers (v %)	EU 28 (v %)
Highly computer literate (have 5 to 6 skills)	42	29
Basic computer literate (have 3 to 4 skills)	40	26
Low computer literate (have 1 to 2 skills)	15	15
Computer illiterate (no skills)	3	11

Source: own.

The data on internet skills from 2013 (Eurostat 2013) shows that proportions of those, who do not master internet skills, are the same between surveyed teachers and the EU 28 users. (Table 4). The data therefore shows that there are few individuals among teachers who are internet illiterate. Individual teachers, who master only one or two skills, are classified as low qualified users, but have lower proportion in comparison with EU 28 users. Among average qualified users are those who master three to four internet skills and the proportion of those is very high as well as in comparison with EU 28. Those with the knowledge of five to six internet skills are placed among the highest qualified users and the proportion between surveyed teachers and EU 28 users is comparable.

Table 4: Internet skills of surveyed teachers

Variables	Teachers (v %)	EU 28 (v %)
Highly ineternet literate (have 5 to 6 skills)	10	12
Basic ineternet literate (have 3 to 4 skills)	69	35
Low ineternet literate (have 1 to 2 skills)	20	30
Ineternet illiterate (no skills)	2	2

Source: own.

4 Discussion and conclusion

EU governments are aware of the importance of Computer and Internet Literacy in education and society as reflected through strategies which systematically enable integrating all citizens into the information society. In the Republic of Slovenia the strategies are very similar as well as the awareness of early education on Computer and Internet Literacy. Computer and Internet Literacy is also very important for

teachers, for they are those who pass on their knowledge to citizens in order to live a successful life with versatile literacy.

With the research among teachers we have found out that the implementation of additional education and training of Computer and Internet Literacy at the selected schools is necessary as the results of self-evaluation are shown. The majority of teachers (65,9%) in the survey have evaluated themselves as average qualified computer and internet users. An interesting result of our research is that they are proportionate with the results got by Eurostat in EU. The majority of the surveyed teachers (69%) belong to the average qualified internet users. A slightly better results are found with teachers with computer literacy, for there are 42% placed as highly qualified users while 40% belong to average computer users. The results have shown that schools have to participate in additional training in order to raise a percentage of high qualified teachers with Computer and Internet Literacy.

In our research we have focused on Computer and Internet Literacy among primary school teachers at selected schools. In the future we would like to repeat the research with a larger number of schools. We would also suggest preparing a self- assessment model on Computer and Internet Literacy based on multi-parameter hierarchical decision-making- DEXi. We also recommend that a new model should include important guidelines of digital competency models such as DigComp 2.1 (Carretero 2017) in DigCompEdu (Redecker 2017).

References

Bawden, D. (2008). *Origins and concepts of digital literacy*. Retrieved from Http://sites.google.com/site/colinlankshear/DigitalLiteracies.pdf#page=19 (3. 11. 2019).

Carretero S., Vuorikari R. in Punie Y. (2017). DigComp 2.1: *The Digital Competence Framework for Citizens*. Luxembourg: Luxembourg Publication Office of the European Union

Carrington, V. & Robinson M. (2009). *Digital literacies: social learning and classroom practices*. London: Sage.

Chaffey, Dave (2007). *E-business and e-commerce management: strategy, implementation and practice*. 3. ed. Harlow: Prentice Hall.

Cotič, M., Medved Udovič V. & Starc S. (2011). *Razvijanje različnih pismenosti*. Ljubljana: Knjižnica Annales Ludus.

European Commission (2007). *Key comptences for lifelong learning – european reference framework*. Retrieved from Http://www.scribd.com/doc/33445618/Key-Competences-for-Lifelong-Learning-%E2%80%93-A-European-Framework (18. 12. 2019).

European Commission (2008). *European commission working paperand recommendations from digital literacy high-level expert group*. Retrieved from Http://ec.europa.eu/ (8. 5. 2019).

European Commission (2010). Europe's digital agenda. Retrieved from https://ec.europa.eu/ (18. 12. 2019).

Eurostat (2013). *Individuals' level of internet skills*. Retrieved from https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_sk_iskl_i&lang=en (2. 10. 2019).

Eurostat (2014). *Individuals' level of computer skills*. Retrieved from https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_sk_cskl_i&lang=en (2. 10. 2019).

Eurostat (2017). *Individuals' level of digital skills*. Retrieved from https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_sk_dskl_i&lang=en (2. 10. 2019).

Gerlič, I. (2011). *Stanje in trendi uporabe informacijsko komunikacijske tehnologije (IKT) v slovenskih osnovnih šolah*. Retrieved from Http://raziskavacrp.uni-mb.si/rezultati-os/ (8. 12. 2014).

Grosman, M. (2010). *Kakšne pismenosti potrebujemo za 21. stoletje*. Sodobna pedagogika 61 (1): 16–27.

Komisija Evropskih skupnosti (2000). Memorandum o vseživljenjskem učenju. Retrieved from Http://linux.acs.si/memorandum/html/ (4. 12. 2019).

Lee, A. Y. L. (1999). *Infomedia literacy: information, communication & society*. Hong Kong: Chinese University.

Muršak, J., Javrh P. & Kalin. J. (2011). *Poklicni razvoj učiteljev*. Ljubljana: Filozofska fakulteta.

Pedagoški inštitut (2014). *Mednarodna raziskava računalniške in informacijske pismenosti ICILS 2013*. Retrieved from Http://www.pei.si/UserFilesUpload/file/raziskovalna_dejavnost/ICILS/ICILS_izrocki%20ZA%20novinarje.pdf (9. 12. 2014).

Redecker C. (2017). *DigCompEdu: European Framework for the Digital Competence of Educators*. Luxembourg: Luxembourg Publication Office of the European Union

SURS – Statistični urad Republike Slovenije (2017). *Pogostost in kraj uporabe računalnikov pri posameznikih, po starostnih razredih in spolu, Slovenija, večletno*. Retrieved from https://pxweb.stat.si/SiStatDb/pxweb/sl/20_Ekonomsko/20_Ekonomsko__23_29_informacijska_druzba__11_IKT_posamezniki__02_29741_uporaba_rac/2974101S.px/ (11. 12. 2019).

SURS – Statistični urad Republike Slovenije (2019). *Pogostost in kraj uporabe interneta pri posameznikih, po starostnih razredih in spolu, Slovenija, letno*. Retrieved from https://pxweb.stat.si/SiStatDb/pxweb/sl/20_Ekonomsko/20_Ekonomsko__23_29_informacijska_druzba__11_IKT_posamezniki__04_29742_uporaba_inter/2974201S.px/ (11. 12. 2019).

Vlada Republike Slovenije (2003). Strategija: *Republika Slovenija v informacijski družbi. Ljubaljana*: Ministrstvo za informacijsko družbo.