FOSTERING DIGITAL LITERACY WITHIN THE SERBIAN EDUCATION SYSTEM

Ljiljana Markovic, Aleksandra Vranes, Milica Jelic Mariokov
Faculty of Philology, University of Belgrade (SERBIA)

Abstract

Digital revolution has deeply influenced and changed the way we learn and work, often blurring the boundaries between these two fields of human activity. Bearing in mind that modern ICTs are providing access to an immense stock of knowledge and information that is freely available online, knowledge workers, as ambassadors of the 21st century workforce, must possess a high degree of digital skills and competences. In order to prepare students for digital era labour market, educational institutions (higher education institutions in particular) are obliged to respond to the challenges that our highly digitized knowledge societies are imposing by incorporating digital literacy courses into their curricula. Such courses strive to instruct students as to how to critically use modern ICTs for retrieving, assessing, storing, producing, presenting and exchanging information, as well as for participating in collaborative networks in online environment.

Under the Key Competences for Lifelong Learning – European Reference Framework, digital competence is set as one of the top priorities, along with the competences of communicating in mother tongue and foreign languages, mathematical and basic competences in science and technology, entrepreneurship and civic skills, the ability to acquire new knowledge and achieve a high degree of cultural awareness and expression. Working diligently to join the European Union, Serbia has adjusted its laws on education with those adopted in the EU. This particularly refers to the Serbian Law on Higher Education, which has been aligned (to the greatest extent possible) with the guidelines stipulated by the European Higher Education Area (EHEA). Moreover, Serbian laws on education are advocating for an increased level of utilization of modern ICTs in the classroom. Hence, in 2013, the National Education Council of Serbia has adopted the document entitled Guidelines for promoting the role of information and communication technologies in education, the same year that the European Commission published DIGCOMP – a Framework for Developing and Understanding Digital Competence in Europe. The Education Development Strategy in Serbia until 2020 also recognizes the significance of using ICTs in teaching in order to improve Serbian education system.

As one of the essential 21st century skills, digital literacy is increasingly becoming an integral part of Serbian education institutions’ curricula. The paper aims at providing an overview of the official documents adopted in Serbia that are advocating for a greater level of implementation of ICTs in teaching and consequently digital literacy courses within the Serbian education system. Furthermore, we intend to present the current situation in terms of teaching digital literacy in Serbia as well as the initiatives and projects that have already been realized in the field. The later include The Digital school project and KODigranje campaign of the Serbian Ministry of Education, Science and Technological Development, which was developed under the Battle for Knowledge initiative in order to increase the digital literacy of primary students, but also the Digital Youthquake project, which aimed at improving digital literacy skills of youth workers. In addition, we will reflect upon the place of Serbian Cyrillic alphabet on the Internet and discuss the opportunity of raising the level of its visibility online by means of fostering digital literacy within the Serbian education system.

Keywords: digital, literacy, knowledge workers, Serbia, education, system, laws, initiatives, projects.

1 THE CONCEPT OF DIGITAL LITERACY AND ITS ROLE IN EDUCATING THE WORKFORCE OF THE FUTURE

Modern information and communication technologies are providing access to an unprecedented stock of knowledge and information. In order to use them appropriately, a number of new skills and competences are required, amongst which those related to the concept of digital literacy stand out in particular. The 21st century gave rise to different types of literacies, such as computer, information and digital literacy. Although often overlapping, digital literacy is somewhat broader concept than the information literacy, as it implies not only the skills of searching, finding, critically evaluating and using information, but also the skills of creating new information and digital content, mastering social
awareness in digital environment, e-safety skills and the like, whereas computer literacy simply refers
to the ability of using computers and other electronic devices in an efficient manner. Furthermore, the
concept of digital literacy "includes a large variety of complex cognitive, motor, sociological, and
emotional skills, which users need (…) in digital environments." Hence, digital literacy could become,
as emphasized by David Bawden in his article on origins and concepts of digital literacy, "a framework
for integrating various other literacies and skill-sets, though it does not need to encompass them all."
Bearing in mind that it requires the most comprehensive set of skills, competencies and strategies,
digital literacy should be fully integrated into the educational systems worldwide. This conclusion
stems from both a modern-day firm belief that everyone deserves equal opportunities for participation
in the digital age and the fact that the 21st century workforce must possess a high degree of digital
literacy, which truly became "a “survival skill” in the technological era—a key that helps users to work
intuitively in executing complex digital tasks."  

1.1 The Necessity for Raising the Level of Digital Literacy in Serbia

In 1997, one of the founding fathers of the digital literacy concept Paul Gilster has argued in the
eponymous book that the "digital literacy is the logical extension of literacy itself, just as hypertext is
an extension of the traditional reading experience." meanwhile cautioning that "acquiring digital
literacy for Internet use involves mastering a set of core competencies. The most essential of these is
the ability to make informed judgments about what you find on-line, for unlike conventional media,
much of the Net is unfiltered by editors and open to the contributions of all." This suggests that one of
the most relevant digital literacy skills is the capacity to properly evaluate a mesmerizing number of
digital content available online. A year later Don Tapscott published the book Growing up digital
discussing the rise of the Net generation (N-generation), which clearly indicates the shift towards new
ways of communication and education in the digital era, as well as foresees the ever-growing
generational gap in terms of digital literacy skills. This particularly refers to the parent-child gap,
whereby it became extremely difficult for parents to keep up with their offspring's digital competencies.
Moreover, parents are faced with additional responsibilities stemming from the digital revolution that
include, amongst others, the necessity of restricting the number of contents that children access
through digital technologies and ensuring a high level of e-safety of children on the Internet. A recent
Blue Whale Game phenomenon is a clear indicator of how vulnerable children can be in digital
environment. Media campaign entitled Better Internet for Children was launched in Serbia in 2017 with
the aim to ensure the safety of Serbian children on the Internet, which consequently will result in
raising the level of their digital literacy competencies as well. Although initiatives such as the above
mentioned are highly recommendable, this paper suggests that digital literacy should not be limited to
sporadic activities of particular institutions, but should instead be fostered on a national level and
officially incorporated into the Serbian education system.

1.2 Digital Literacy within the Educational Systems Worldwide and Lifelong Learning Digital Literacy Initiatives in the EU, US, Australia and New Zealand

Educational institutions, and above all higher education institutions are obliged to respond to the
challenges that our highly digitized knowledge societies are imposing by including digital literacy
courses into their curricula and preparing students for digital era labour market. These courses should
instruct students how to use critically modern ICTs for retrieving, assessing, storing, producing,
presenting and exchanging information, as well as for participating in collaborative networks in online
environment. Digital literacy should be taught from the earliest age, provided, of course, that digital
content is adjusted to the age of children. Advocating for the development of digital literacy in early
childhood, Marsh proposes very complex and novel forms of literacy pedagogies that would be based
on "observation and analysis of children's participatory engagement with texts for which they have an
affinity and for which they are willing to participate in complex learning situations for a sustained period
of time"6, which hence also include popular culture. On the other hand, digital literacy should be

---

5 Idem. p. 2.
fostered as part of the lifelong learning process, whereby elderly citizens should also be encouraged to acquire these relevant 21st century skills.

Countries worldwide have adopted national digital strategies with the aim to provide guidelines for increasing the level of digital literacy skills of their citizens. The Organisation for Economic Co-operation and Development has drafted the report Skills for a Digital World on May 25, 2016, in which digital literacy, i.e. its presence within 35 member countries, is discussed in the framework of the overall need to foster skills development for the digital economy. The report stipulates that “in many OECD countries, the promotion of digital literacies falls primarily in the hand of national education ministries, which determine the extent to which ICT skills are included in the curriculum.”

UNESCO Institute for Information Technologies in Education has stated that “at the end of the 20th century, ICTs became standard in most American and European countries for teaching, learning, assessment, management, and communication in schools.” However, the extent differs greatly from one country to another. The above mentioned report has also emphasized the need to develop the most effective digital pedagogy, which often lacks when teaching digital literacy in the classroom.

Scandinavian countries are leading in terms of fostering digital literacy in Europe. In fact, “Norway implemented a new national curriculum in 2006, which increased the status of digital literacy to be the fifth basic competence in the Norwegian elementary school (stage 1-13), thus becoming the first country in the world to attribute that much of importance to the process of attaining digital literacy skills. At the same time, Norway is one of the countries with the highest percentage of Internet users, whereby “according to the Norwegian Media Barometer 2015, 87 percent of those aged between 9 and 79 use the Internet during the course of a day. Use is highest (99 percent) among younger users between 16-24 years old, while 52 percent of those aged 67-79 use the internet any given day.”

Moreover, the Norwegian Ministry of Local Government and Modernisation is dedicated to supporting a greater participation of elderly people in digital world.

Sweden is an excellent example of not only how digital literacy can be integrated into the formal education system, but also how it can be used to tackle the issue of gender disparity in IT sector. Namely, at the level of Swedish compulsory public education system “education for ICT is integrated in curricula as a learning outcome: “every pupil, on completing primary and lower secondary school, must be able to use modern technology as a tool for knowledge-seeking, communication, creation and learning”.” However, in 2015 Olof Sudin argued that “it does not appear that the (Swedish) curriculum has translated the phenomenon of information searching and evaluation to contemporary technologies for searching and communicating on the Internet with a critical perspective,” which results in students’ inability to evaluate whether the information they find is valid or not. Furthermore, digital literacy should become a greater part of initial teacher education, whereby “in the government’s proposition concerning a new (Swedish) teacher education (Regeringen, 2010) it is stated that ICT is one of four overriding perspectives that should permeate the whole programme (the others being scientific/critical, historical and international).” As mentioned above, Sweden also stands for promoting gender equality by raising the participation rate of women’s enrolment in IT related academic training programs, thus attracting a larger share of the Swedish female population to pursue ICT academic and professional careers.

A number of initiatives were realized within the EU outside the classroom setting. The Federal Ministry of Education and Research in Germany began organizing Informatik-Biber competition for school children once a year since 2007. The overall aim of this competition is to incite interest in computer

---


11 Ibid.


science of children aged from 10 to 16 years. This fits perfectly with the Digital Germany 2015 agenda and demonstrates a proper understanding of future tendencies at labour markets worldwide by the German authorities. Spanish project EducaRed deserves special attention as the educational platform 2.0, within which numerous topics related to digital literacy are being discussed. Although it was initially supported by the Telefonica Foundation, “12,000 Spanish educational centres (also) take part in the network.”\textsuperscript{14} Moreover, considering that the working language of the platform is Spanish a number of Latin American countries use the resources of this educational platform and participate in its workgroups. Praising “Internet as a tool for innovation and pedagogical training”\textsuperscript{15}, EducaRed is intended for a broad range of stakeholders that include parents, teachers as well as students. Concerned by the percentage of the citizens who never used Internet before and determined to excel in the field of digital economy, Portuguese government has supported the initiative ICT and Society Network within the National Strategy for Digital Literacy and Inclusion. One if its goals refers to creating “a network structure capable of working collaboratively to promote digital literacy.”\textsuperscript{16}

US, Australia and New Zealand are countries that invest significant funds and human resources with the aim to foster digital literacy skills and competencies of their citizens, as they fully understand that a substantial economic development can only be achieved if the workforce possesses a high degree of these 21\textsuperscript{st} century valuable skills. For example, within the Computer Science for All Initiative, the US government has allocated as much as “$4 billion in funding for states, and $100 million directly for districts in the forthcoming Budget to increase access to K-12 CS by training teachers, expanding access to high-quality instructional materials, and building effective regional partnerships.”\textsuperscript{17} Moreover, over 60 million dollars were donated by companies such as Google and Microsoft. This again leads us towards another important question that implies a participation of private sector in initiating and funding projects that aim to increase the level of digital literacy of employees. The same model could be applied in Serbia, considering that there are many start-up companies that focus their activities on ICTs and bearing in mind that Serbian labour force is not sufficiently digital literate.

Australian Government’s Department of Education and Training has launched the initiative Digital Literacy School Grants (DLSG) and is willing to allocate from 10,000 to as much as 50,000 Australian dollars to schools and educational organizations nationwide for the projects proposals that offer innovative ways of fostering digital literacy in schools. This initiative was devised “under the Inspiring ICTs and bearing in mind that Serbian labour force is not sufficiently digital literate.

Under the Key Competences for Lifelong Learning – European Reference Framework, digital competence is set as one of the top priorities, along with the competences of communicating in mother tongue and foreign languages, mathematical and basic competences in science and technology, entrepreneurship and civic skills, the ability to acquire new knowledge and achieve a high degree of cultural awareness and expression. Working diligently to join the European Union, Serbia has adjusted its laws on education with those adopted in the EU. This particularly refers to the Serbian

\begin{multicols}{2}

2 DIGITAL LITERACY AS PART OF THE STRATEGIES AND GUIDELINES ADOPTED IN SERBIA

Under the Key Competences for Lifelong Learning – European Reference Framework, digital competence is set as one of the top priorities, along with the competences of communicating in mother tongue and foreign languages, mathematical and basic competences in science and technology, entrepreneurship and civic skills, the ability to acquire new knowledge and achieve a high degree of cultural awareness and expression. Working diligently to join the European Union, Serbia has adjusted its laws on education with those adopted in the EU. This particularly refers to the Serbian

\footnotesize{\begin{itemize}
\item\textsuperscript{15} Ibid.
\end{itemize}}
Law on Higher Education, which has been aligned (to the greatest extent possible) with the guidelines stipulated by the European Higher Education Area (EHEA). Accordingly, Serbian laws on education are advocating for an increased level of utilization of modern ICTs in teaching. To this end, a number of strategies and guidelines were drafted and adopted in Serbia aimed at supporting the modernization of teaching and improving the curriculum at all level of studies by means of introducing new types of literacies, such as digital, computer and information literacy.

In 2005, the National Strategy for an Information Society in Serbia was created in order to emphasize the ever-pressing need to adjust Serbian society to the one “where information dominates new modes of social organization.” In addition to strongly advocating for the development of technology enhanced education and culture, within the seventh chapter entitled E-education, it stipulates that Serbia must strive to make its citizens computer literate so that they can become equal members of information society. This strategy was followed in 2010 by The Information Society Development Strategy in the Republic of Serbia until 2020, which became part of the Digital Agenda for the Republic of Serbia, aligned with the Digital Agenda for Europe. Similarly to the previously mentioned strategy, it accentuates the importance of developing “knowledge and skills related to ICT and the increasing role of ICT in the education system.” However, in addition to building upon the 2005 strategy, the new strategy clearly distinguishes the significance of fostering digital literacy as a way of developing information society in Serbia by indicating the need of raising “the general level of e-skills in the Republic of Serbia, starting with the professional knowledge and skills in the field of ICT, through digital literacy and advanced skills needed to use technologies.” Following the same line of thinking, the National Education Council of Serbia has adopted in 2013 the document entitled Guidelines for promoting the role of information and communication technologies in education, the same year that the European Commission published DIGCOMP – a Framework for Developing and Understanding Digital Competence in Europe, which lists new forms of literacies, digital literacy included.

Despite the fact that the numerous strategies and documents were drafted and were (more or less) successfully adopted in the past, Serbian education system still lacks a unified position on integrating digital literacy into its study programs. The Education Development Strategy in Serbia until 2020 only mentions the implementation of ICT’s in teaching as a means of improving Serbian education system, while The Strategy on Scientific and Technological Development of the Republic of Serbia for the period 2016-2020 indicates that the IT sector has the best chances of rapid development in Serbia through emphasizing the fact that the “electronics, telecommunications and information technologies are the most successful areas in the number and commercialisation of achieved technical solutions.” In line with this modern IT orientation of Serbian labour market, the Strategy and Policy of the Industrial Development of the Republic of Serbia for the period 2011-2020 advocates for educating a new generation of workers in Serbia that will be fully capable of giving their contribution to the “special ICT models of the factories of the future - SMART factories, DIGITAL factories, VIRTUAL factories,” which will be established in Serbia. In order to respond to these modern labour market needs, Serbian education institutions should strive to revise their curricula and include, amongst others, digital literacy skills and competencies as desired learning outcomes.

### 2.1 Projects and Initiatives that Helped Foster Digital Literacy in Serbia

Although Serbia is yet to design and fully implement digital literacy curriculum within the Serbian educational institutions, several initiatives and projects were successfully realized in the field. The first one was The Digital School project, which was launched by then Serbian Ministry for Telecommunications and Information Society. The project aim was to raise the level of digital and computer literacy skills of Serbian primary schools’ students. It included a great number of primary schools, amongst which were also those located in underdeveloped parts of Serbia. Therefore, an additional goal of the project was to support social inclusion and reduce poverty on the entire territory of Serbia. The main deliverables of The Digital School project include numerous digital study

---


21 Ibid, Encouraging the Development of E-Commerce.


classrooms/labs throughout Serbia, which were fully equipped with some 30,000 computers and software, i.e. digital tools that enable primary students to attain a necessary level of digital and computer literacy. Moreover, Serbian primary school teachers were trained in order to fully utilize benefits of these digital classrooms/labs. Project outcomes can be summarized in the following words: The Digital School project has “contributed considerably to raising the digital literacy level in Serbian primary schools, introduced an innovative teaching approach, reduced the rural-urban digital literacy gap from 39% to 11% and improved students’ and teachers’ knowledge of online safety, according to the UN and UNESCO Broadband Commission report on education and ICT.”

The Serbian Ministry of Education, Science and Technological Development has supported the B92 Fund initiative The Battle for Knowledge, along with the Association of Serbian Science Professors and Centre for Creative Thinking. KODigranje campaign, which can be translated as CODEplay campaign, is a part of that initiative. It aims at increasing the level of computer and digital literacy knowledge of Serbian primary school children. At the beginning of the campaign, various IT and robotic equipment was donated to primary schools throughout Serbia. This was followed by teachers’ trainings, which were held within the selected primary schools, whereby teachers were instructed how to appropriately utilize teaching tools, mBot robots distributed to the schools participating in the campaign, as well as how to teach the use of modern digital technologies in general. Moreover, we deem that the most interesting part of the KODigranje campaign is its Competition League, which is composed of Serbian primary schools’ teams of young programmers. The online round of the KODigranje competition was recently completed, while the offline, final round is yet to be held on the 27th of May in a number of Serbian cities. “The aim of the campaign is that with the help of learning programming/coding develop at primary school children critical thinking and problem solving skills, but also to motivate them in the future work related to ICT and the so-called STEM occupations, or in areas of natural and mathematical sciences, technology and engineering.” Accordingly, the final objective of the campaign will be to introduce future Serbian workforce into the prosperous field of programming, all the while fostering significant 21st century skills and literacies.

In 2016, the training course entitled Digital Youthquake was held in Belgrade, which gathered youth workers and activists (aged between 18 and 35) from Montenegro, Macedonia, Bosnia and Herzegovina Estonia, United Kingdom, Belgium, Latvia, Albania and Serbia. Digital Youthquake project’s overall objective was to increase the level of digital literacy and incite digital activism of youth by introducing and further instructing participants in the world of digital media and diverse online communication tools and platforms, such as Facebook, Slack, Trello, WordPress, MailChimp, Canva and the like. Hence, “the training course provided digital literacy/activism transversal (technical, practical and analytical) skills for 30 youth workers.” In addition, these NGO’s representatives were encouraged to develop campaigns for their projects by means of modern digital technologies. Bearing in mind that the training has attracted an international pool of youth workers and activists, Digital Youthquake has given multiple opportunities for intercultural exchange, while putting Serbian culture at the forefront. Although the project was not only limited to increasing digital literacy skills of the Serbian youth, Serbian participants have benefited the most from it considering that Belgrade represented the hub of the project wherefrom future digital collaboration between youth workers can be achieved.

2.2 Suggestions for Integrating Digital Literacy into the Serbian Education System

The above mentioned initiatives and projects have increased digital literacy knowledge and skills amongst Serbian primary school children and youth. However, similar initiatives are lacking in secondary school education as well as at the higher education level. We deem that the Serbian education system should follow the example of Sweden and, thus introduce digital literacy as the expected learning outcome on all level of studies. This would lead towards creating digital literate Serbian workforce that would be fully capable of responding to the challenges of the 21st century global (virtual) labour market. Moreover, digital literacy should be fostered within the Serbian


education system in order to prepare students for the process of lifelong learning, which became inevitable in digitized knowledge societies.

A clear set of guidelines should be drafted and adopted on a national level and distributed to educational institutions nationwide with the aim to establish digital literacy education in Serbia. These guidelines should, of course, make a clear distinction between digital literacy competencies that are expected upon the completion of primary, secondary and academic level of education by gradually increasing learning requirements. Similarly to the initiative of The National Library of New Zealand, school (academic) librarians can be entrusted with the responsibility of transferring knowledge in the field or they can share this responsibility with professors teaching Serbian language and/or Technical and computer education. In this way, digital literacy can be fully integrated into the Serbian education system. Moreover, Serbia should come up with a unified approach in order to overcome digital literacy and digital skills gap resulting, above all, from a lower level of digital literacy skills of its elderly citizens and strive to incite Serbian female population for equal participation in the digital economy.

2.3 The Role of Digital Literacy in Increasing the Presence of Serbian Cyrillic Alphabet on the Internet

Being one of the two officially recognized alphabets in Serbia, the Cyrillic alphabet is extremely threatened in digital environment by the Latin alphabet. One of the main reasons for this situation is most certainly the hegemony of the English language on the Internet. Namely, the authors of digital content in Serbian language are more inclined towards the use of Serbian Latin alphabet due to a great number of anglicisms that are quite often being used when writing digital contents, which particularly refers to the words that are practically untranslatable to other languages. In many cases, certain expressions and even whole sentences are left in their original language, i.e. in English. An entire paper can be written on how deeply the use of such foreignisms in digital environment is influencing the general level of literacy of our population, but for the purpose of this paper we will state that this issue is one of the reasons why the authors of digital content in Serbian language are using the Latin alphabet to a greater extent than the Cyrillic alphabet.

We can increase the visibility of Serbian Cyrillic alphabet on the Internet by fostering digital literacy within the Serbian education system. As part of the digital literacy curriculum, we can teach our children about the dangers that can arise if they continue to avoid using Serbian Cyrillic alphabet online, i.e. the possibility of its extinction, thus preventing this happening in the future. Furthermore, we can offer the solutions to the above mentioned issues by drafting and distributing a glossary of problematic English expressions translated into the Serbian language (written, of course, in Cyrillic). The Faculty of Philology of the University of Belgrade, as the most significant higher education institution in Serbia in terms of fostering the study of Serbian language, literature and culture as well as the one that strongly advocates for the preservation of the Serbian Cyrillic alphabet in our increasingly digitized society, can assume the role of writing and publishing such a glossary in order to support a greater presence of the Cyrillic alphabet online.

3 CONCLUSION

The paper has presented the role of digital literacy in educating the workforce of the 21st century, while particularly emphasizing the need of integrating digital literacy within the Serbian education system. It offered examples of good practices of countries that have already included digital literacy into their formal and informal study programs. A number of strategies adopted in Serbia that remotely relate to the field of digital literacy were discussed and the solutions to the insufficient inclusion of digital literacy contents into the curriculum of Serbian education institutions were offered. Finally, the paper indicated that the level of presence of Serbian Cyrillic alphabet on the Internet can be substantially increased by fostering digital literacy within the Serbian education system.

REFERENCES


