DIGITAL EDUCATION STRATEGY IN SERBIA AND EXPERIENCE OF ONLINE LEARNING DURING COVID-19 PANDEMIC

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Abstract

According to the European Commission announcement: Advancement of schools and skillful teaching, by a Resolution of the European Parliament on education in the digital age, Serbia has formulated The Strategy for Education Development that accentuates the need of establishing new teaching and learning methods in the ever mobile and digital world. Educational politics in Serbia is directed at promoting the key digital competencies required for the 21st century life. Development of modern digital technology opened up new opportunities for advancement in education which enables students to gain knowledge, required for future work and life, in a faster and more exceptional manner. Although it has already been recognized that education should undergo a more complex digital transformation, the transformation has occurred suddenly and abruptly due to pandemic COVID-19. We conducted research on students who had their first experience with online classes last year due to the pandemic. The research was carried out on College of Health Studies, Cuprija, Serbia, on final year students, a week after the end of the first semester. Our results suggest that students had positive experience and attitudes toward online learning, high levels of functional skills, and lower levels of strategic competencies (information evaluation, content creating, knowledge constructing, creativity). This paper further considers the results of the study and demonstrates the process of changing the nature of knowledge, and the change in education methods in the future.

Keywords: *digital education, online classrooms, e-learning, covid-19*

1. INTRODUCTION

The world is currently undergoing a digital technology revolution. Computers, mobile phones and social media platforms are transforming our everyday life. Innovation and technological evolution are reshaping our society, furthermore, education and training systems became a significant part of the digital transformation. Modern technologies are creating new learning opportunities that challenge the traditional learning methods of schools and colleges. People of all ages are now able to take their education out of school and into their homes and workplaces where they can decide what they want to learn and how they want to learn [1]. Information and communication technology (ICT) is an important focus for 21st century education and needs to be effectively integrated into formal teaching and learning [2]. Digital transformation of Higher Education institutions has been a topical issue for several years [3] and can be regarded as the summation of all digital processes required to accomplish transformation that gives Higher Education institutions the opportunities to positively and optimally apply digital technologies [4].

Strategy for digital education University of Oxford [5] asserts that students should benefit from the increased learning opportunities that digital education offers and academic staff should be supported in innovating in teaching methods. The European Commission developed the 2021-2027 Digital Education Action Plan which builds up on the 2018-2020 plan that had the following priority areas: making better use of digital technology for teaching and learning, developing digital competencies and skills, improving education through better data analysis and foresight. This plan focuses on two interrelated aspects of digital education: fostering the development of a high-performing digital education ecosystem (by deploying digital technologies, apps, platforms and software to improve and extend education and training) and enhancing digital skills and competences for the digital transformation (including infrastructure, strategy and leadership, teacher skills, learner skills, content, curricula, assessment and

national legal frameworks) [6]. European Commission launched the Digital Skills and Jobs Coalition in order to tackle growing digital skills deficits in Europe and provide all EU citizens with the skills needed for thriving in a digital economy and society [7]. The Resolution of European Parliament emphasizes that a coherent approach based on lifelong learning in formal and informal educational environments, with measures and guided interventions, which meet the needs of different age groups, is required for providing citizens with digital skills. Digital technologies, planned and meaningfully incorporated in the learning process, should support the transformation to student-centered pedagogical approach [8]. Modeled by the European Digital Education Action Plan, Serbia has formulated The Strategy for Education Development that accentuates the need of establishing new teaching and learning methods in the ever mobile and digital world.

The Government of the Republic of Serbia recognized its key priority: the digitalization of the country, accentuating developing digital skills amongst citizens. According to the Statistical Office of the Republic of Serbia, 34,2% citizens aged 15 and older are computer literate, compared to 14,8% which are partially computer literate. The Internet is used by 90,8% citizens with Higher and High Education. Large percent of young people (98,0%) use the internet via mobile phones every day and, on average, spend more than three hours a day on the internet. They use the internet for fun, to communicate with friends and for social media platforms [9]. The Government of the Republic of Serbia developed the Strategy for development of digital skills for the period of time from 2019 to 2023, in order to utilize the potential of modern ICT in the direction of raising the quality of life of all citizens, greater work efficiency and economic growth of society. The term digital skills implies possessing appropriate knowledge, skills and behavior in accordance with needs of both an individual and the society in the conditions of modern rapid development of ICT in 21. century. Education is one of the central topics of the Strategy. Development of modern digital technologies opened up new opportunities for advancement in the educational process, which enable students to gain knowledge, required for future work and life, in a faster and more exceptional manner. In this respect, digital lectures, including different learning processes compared to traditional learning methods, are being created [10]. Special part of the Strategy refers to the program of developing digital competencies for teachers in order to efficiently and responsibly utilize digital resources in education and learning processes. According to these identified needs, the Ministry of Education and Science published Digital Competences Framework - Teacher of the Digital Age in 2019, with a goal of providing support for teachers in the process of digital concepts, tools and content integration in everyday educational practice [11].

Following the sudden and unexpected outbreak of Covid-19, most countries put physical distancing measures (e.g., closing of public, cultural, and educational institutions) in place to decelerate the infection rate [12]. Schools and colleges have to face a new challenge to implement “distance learning” tools to continue education. Digital educational transformation was accelerated in these highly difficult circumstances and rapid, large-scale changes in the educational system have been triggered. Developments and changes that could have taken years happened in a span of a few weeks [6]. The professors all over the world have found themselves compelled to deal with distance learning overnight, although most of them weren’t well prepared. Students have had to change from a model based on obligations and face-to-face learning to a model in which they have to become fully involved in their learning [13].

The Ministry of Health of the Republic of Serbia declared the first registered Covid-19 case on March 6th, 2020. State of emergency with complete prohibition of movement and closure of all institutions, was declared on March 15th which lasted until May 6th. Educational system entirely reorganized its work in this period of time, and after a short suspension of work, launched different forms of teaching. According to the crisis headquarters recommendations and epidemiological measures, the new school year 2020/2021 started and took place on online platforms during the first semester. It is important to understand the experiences and perceptions of the students when faced with this important change in their education in order to define the strong and weak point of the new adopted distance learning methods. The objective of this study is to discover the learning experiences and perceptions of the changes in education of final year students enrolled in College of Health Studies, Cuprija, Serbia, when faced with the abrupt change from face-to-face to e-learning education during the Covid-19 pandemic.

2. MATERIALS AND METHODS

The research was carried out on College of Health Studies, Cuprija, Serbia, on final year students, a week after the end of the first semester. College of Health Studies Cuprija is an accredited, independent Higher Education institution, which educates vocational health workers for the needs of health care services, with the level of studies: Undergraduate vocational studies (180 ECTS) in a duration of three years. College of Health Studies adapted to epidemiological measures and requests, when the state of emergency was declared, and proposed several approaches for the end of the semester. These changes included sending presentations, lecture materials, accepting and evaluating students' essays, and using email and several phone apps for communication with the students.

During the summer break, College reorganized its work and completely transferred its courses to online platforms. Therefore, lectures and practical courses were held through online platforms such as Google Classroom, and Google Meet, used for regular communication between students and professors, in the winter semester 2020/2011. Google Classroom is a learning management system (LMS) that aims to simplify creating, distributing, and grading assignments and engaging students in learning online or remotely. Assignment creation and distribution is accomplished through Google Drive, while Gmail is used to provide classroom communication. Students can be invited to classrooms through the institution's database through a private code that can then be added in the student interface or automatically imported from a School Information Management System. Google Classroom has a quick and convenient set up, easy log in and receiving and turning in assignments are facilitated. It is accessible from all computers, mobile phones, and tablets.

Curriculum content was covered on defined schedule and lecture hours, and all courses were transferred to virtual platforms with students attending them online. Students continued with their usual tasks: active participation in practical lectures, writing and presenting their essays, knowledge tests; while professors were obliged to prepare presentations and lectures, to organize tasks for students, to send feedback and be open for virtual communication through email and online school platform.

The sample of the study included final year students (N=99). All students voluntarily agreed to participate, and a week after the end of the semester the research was carried out. The survey was created for the purposes of this research. The survey contained evaluative statements regarding time spent online, their experience with online learning (the way online lectures were organized, the way the students handled and adapted to the new learning methods), their perceptions on online lectures (what are common advantages and disadvantages of online learning methods), their activities online (did they participate in more creative and productive activities online during this semester), and their attitudes toward digital education. The survey was evaluated anonymously, and abstention was allowed for each statement.

Statistical analysis was performed using IBM SPSS Statistics and the responses were represented as frequencies.

3. RESULTS AND DISCUSSION

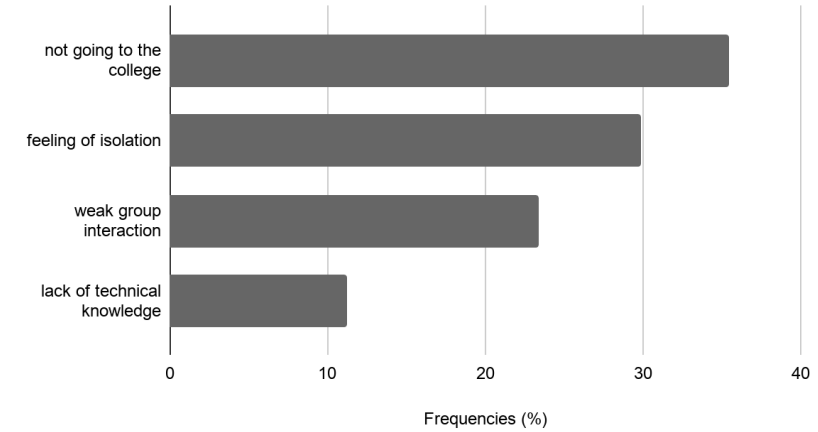
3.1. Results

The survey was carried out on College of Health Studies, Cuprija, Serbia, on final year students (N=99), a week after the end of the first semester. Two thirds of students (60,6%) are female, and other third (39,4%) male. Most participants (74,8%) own two or three digital devices (desk-top computer, lap top, mobile phone). Moreover, 82,8% of them spend 3 or more than 3 hours a day on the internet.

On average, students didn't have any significant problems with attending online classes, except small technical problems. Students evaluated their experience with online classes as satisfactory, although almost one third (28,3%) remained neutral.

There are several personal difficulties (Chart 1) students reported experiencing during the virtual classes: not going to the college and not having extracurricular activities (35,5%), a feeling of isolation (29,9%) and weak group interaction (23,4%).

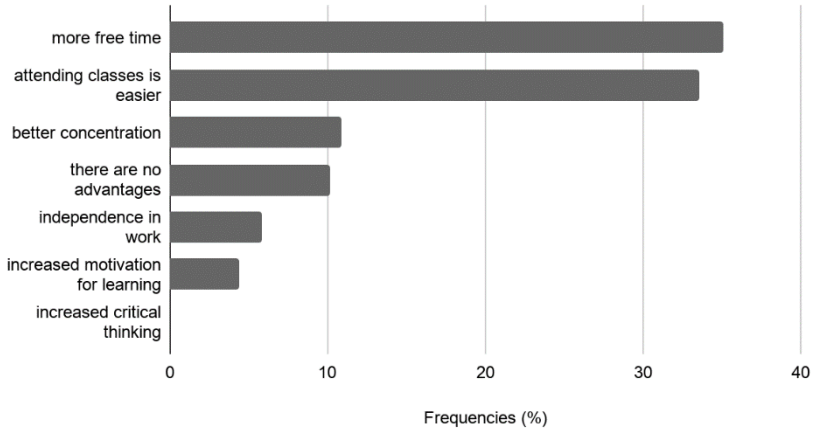
Chart 1. Personal difficulties experienced during online lectures.



Assessing the quality of online courses, students reported that some of the courses were well planned and organized, but some of the courses didn't meet their needs. Frequent online class types are: interactive classes with students' active involvement (49,1%), classes with traditional students' involvement (37,9%). Small number reported attending online courses involving multimedia content, workshops or team work (13,0%).

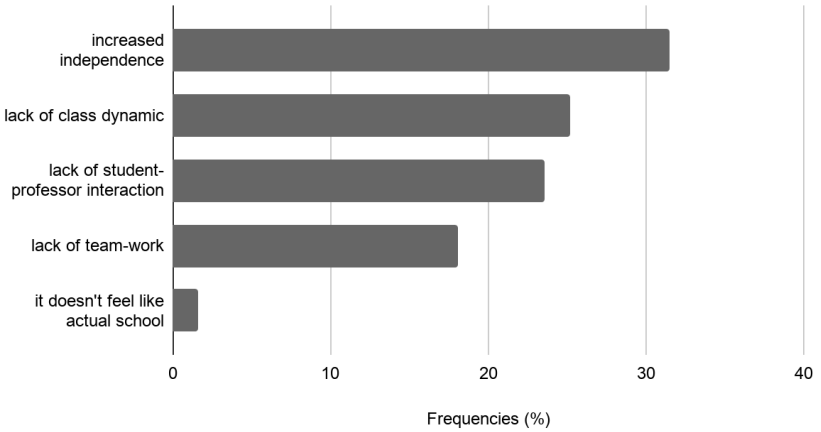
Some of the advantages of virtual courses (Chart 2) reported by this group of students are: more free time (35,1%), attending classes is facilitated and easier (33,6%), better concentration (10,9%). Small number reported that there are zero advantages of attending online classes (10,2%).

Chart 2. Percieved advantages of attending online lectures.



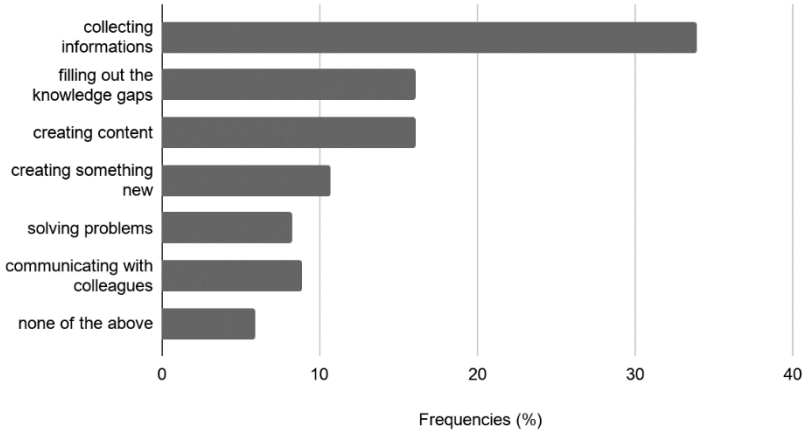
Main disadvantages of attending online courses (Chart 3) are: increased independence in school work (31,5%), lack of atmosphere and class dynamic (25,2%), lack of student-professor interaction (23,1%) and also lack of teamwork (18,1%). Moreover, students reported their own objections to online classes and professors: poor lecture organization, professors being late for classes, lack of professors' activity during the classes, lack of explanation, professors' lack of training for online lectures.

Chart 3. Percieved disadvantages of attending online lectures.



During the current semester, students were using the internet for the following activities (Chart 4): collecting, analyzing and checking information (33,9%), creating and sharing content (16,1%), filling in the knowledge gaps after lectures (16,1%) and creating something new and original (10,7%).

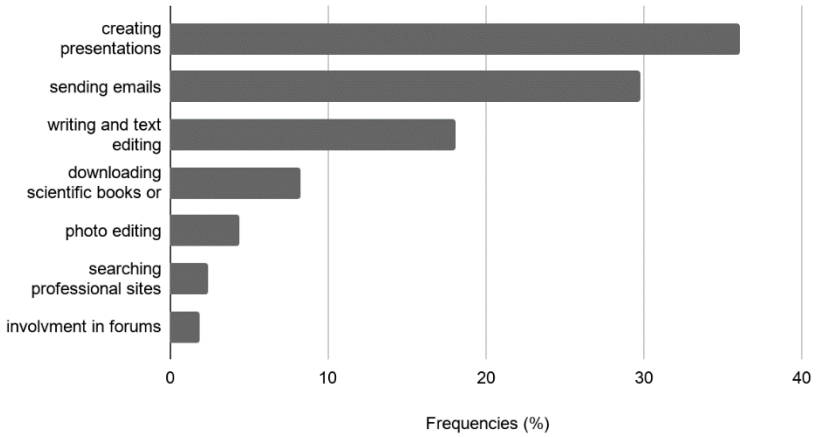
Chart 4. Online activities during current semester.



Frequent online activities related to college and lecture obligations (Chart 5) are: creating presentations (36,1%), sending emails (29,8%) and writing and text editing (18,1%). Small number reported other activities such as reading and downloading books and researches related to course topics, involving in forum discussion, surfing and visiting professional sites, etc. (16,0%).

Most participants (77,8%) haven't attended any virtual lectures before the pandemic, compared to smaller numbers that have attended some online courses once or several times (22,2%). Majority (90,9%) consider digital skills necessary for living and working at 21. century. In general, students believe (72,0%) that radical digital changes in the education system are required.

Chart 5. Online activities related to lecture obligations.



3.2. Discussion

Covid-19 pandemic and physical distancing measures have an enormous impact on education. The winter semester 2020/2021 was completely transferred to online platforms, such as Google Meet and Google Classroom, enabling students to attend lectures from their homes, a measure required for preventing the spread of the virus. Assessment of the quality of the online lectures is a necessary task and an opportunity to speed up reform of online education.

Most participants own two or three digital devices, which they use for online classes, and they spend 3 or more than 3 hours a day on the internet. Overall, students didn't report any significant problems with their attendance, except some small technical problems. It is described that ease of access is important for online learning [14]. Therefore, it is important that the online platform used for distance lectures was app-based and easy to use, so the students could even use their mobile phones or tablets to participate.

Even though most of the students found that the level of the organization of online lectures meet their standards and needs, they reported experiencing several personal difficulties during their attendance to online courses. Students consider not attending face-to-face lectures and extracurricular activities as a difficulty that occurred during the semester which was transferred to online platforms. These findings are in line with the literature - some curriculums rely on practical courses (such as nurse training) which require face-to-face teaching and practice [15]. Students also felt isolated and in need of a better group interaction, which is in accordance with the notion that learning in the conventional classroom was more motivating than distance learning due to face-to-face engagement with professors and class fellows [16]. Maintaining continuous interaction between fellow students, and feedback exchange between students and professors, besides the emotional and social support, present the key factors of effective learning [17].

There are also several advantages of attending virtual courses according to this group of students. Most of them reported more free time, easier access and better concentration. Online learning is defined as flexible, accessible and less time and resource consuming, enabling students to access learning materials whenever they want [18].

Students reported attending interactive online classes which required their active involvement and classes with traditional types of participation. Only a small number of them reported attending online classes involving multimedia content, workshops or team works, implying that promoting online education through innovative course content, problem-based learning, state-of-the-art technology and efficient management is a necessary task for schools and colleges across the world [19].

Their frequent online activities related to their course obligations (creating presentations, sending emails and writing essays) suggest that even though they spend a great amount of time online, there is an

obvious lack of internet use for creative and innovative purposes, for evaluating information and knowledge construction, for problem-based learning and relying on external resources. There is zero interest in literature search, analyzing and gathering recent research data and participation in discussions regarding recent findings, even though a large number of online libraries, archives and databases is available [19]. This is a great opportunity to promote student-centered learning, which is an important competency for encouraging lifelong learning [20].

Results also suggest that students have high levels of functional skills, and lower levels of strategic competencies (information evaluation, content creating, knowledge constructing and creativity). This is in line with findings of another research which suggest that students frequently use the internet as consumers of content instead of using it as content creators or for academic purposes [21]. Students show a much lower performance on information and strategic skills than operational and formal skills (knowledge of web-related terms and technological concepts) [22].

The most important assignment of contemporary education is to make insightful and productive use of digital technology resources [23]. Though Covid-19 pandemic had a severe impact on education, education systems should take this unexpected opportunity to develop new and more flexible curricula with a high amount of distance learning, promoting innovative, creative, problem-based and student-centered learning methods.

4. CONCLUSIONS

The Covid-19 outbreak made long term changes in the education system and sped up the reform of digital education. Overall, students had a positive experience with online lectures and managed to adapt to the distance learning methods. Online learning modalities encourage student-centered learning and they are easily manageable during pandemic. Students' participation and involvement can be considered more technical than innovative, implying that further development and implementation of online learning methods, including rich multimedia content, problem-based learning, productivity and creativity, are necessary for 21st century. There is a need to train faculty members on the use of online modalities and developing innovative and more interactive lecture plans.

REFERENCES

1. Collins, A & Halverson, R 2010, „The second educational revolution: rethinking education in the age of technology", *Journal of Computer Assisted Learning,* vol. 50, no. 1, pp. 18-27, viewed 19 January 2021, <https://onlinelibrary.wiley.com/>
2. Ratheeswari, K 2018, „Information communication technology in education", *Journal of Applied and Advanced Research*, vol. 3. no. 1, pp. 45-47, viewed 2 February 2021, <https://pdfs.semanticscholar.org/>
3. Bond, M, Marín, V, Dolch, C, Bedenlier, S & Zawacki-Richter, O 2018, „Digital transformation in German higher education: Student and teacher perceptions and usage of digital media", *International Journal of Educational Technology in Higher Education*, vol. 15, no. 1, pp. 47-48, viewed 24 January 2021, <https://educationaltechnologyjournal.springeropen.com/>
4. Kopp, M, Gröblinger, O & Adams, S 2019, „Five common assumptions that prevent digital transformation at higher education institutions", *INTED2019 Proceedings*, pp. 1448–1457, viewed 7 February 2021, <https://www.researchgate.net/>
5. University of Oxford 2016, *Digital Education Strategy*, University of Oxford , viewed 11 January 2021, <https://www.ctl.ox.ac.uk/digital-education-strategy#collapse1238716>
6. European Commission 2020, *Digital Education Action Plan (2021-2027)*, European Commission, viewed 20 January 2021, < https://ec.europa.eu/education/education-in-the-eu/digital-education-action-plan_en>

7. European Commission, 2020, *European Skills Agenda (2020-2025)*, European Commission, viewed 21 January 2021, <https://ec.europa.eu/social/main.jsp?catId=1223>
8. Committee on Culture and Education 2018, *Education in the digital era*, Committee on Culture and Education, viewed 17 January 2021, <https://www.europarl.europa.eu/committees/en/education-in-the-digital-era/product-details/20180921CHE04881>
9. Kovacevic, M, Pavlovic, K & Sutic, V 2018, *Upotreba informaciono-komunikacionih tehnologija u Republici Srbiji*, ISSN 1820-9084, Republicki zavod za statistiku, pp. 18-27, viewed 23 January 2021, <http://publikacije.stat.gov.rs/G2018/Pdf/G201816013.pdf>
10. Republic of Serbia, Ministry of Trade, Tourism and Telecommunication 2020, *Strategy of digital skills development in the Republic of Serbia (2020-2024)*, Official Gazette of the RS, no. 30/18, pp. 1-4, viewed 15 January 2021, <https://mtt.gov.rs/en/download/Strategy%20of%20Digital%20Skills%20Development%20in%20the%20Republic%20of%20Serbia%20for%20the%20period%202020-2024.pdf>
11. Ministry of Education and Science 2019, *Digital Competences Framework - Teacher of the Digital Age*, Ministry of Education and Science, viewed 16 January 2021, <http://www.mpn.gov.rs/usvojen-novi-okvir-digitalnih-kompetencija-nastavnika/>
12. Steffens, I 2020, „A hundred days into the coronavirus disease (COVID-19) pandemic", *Eurosurveillance*, vol. 25, no. 14, pp. 1-2, viewed 9 February 2021, <https://www.eurosurveillance.org/content/>
13. Ramos-Morcillo, AJ, Leal-Costa C, Moral-García, JE & Ruzafa-Martínez, M 2020, „Experiences of nursing students during the abrupt change from face-to-face to e-learning education during the first month of confinement due to COVID-19 in Spain", *International journal of environmental research and public health*, vol. 17, no. 15, pp. 1-2, viewed 7 February 2021, <https://www.mdpi.com/>
14. Asiry, MA 2017, „Dental students' perceptions of an online learning", *The Saudi dental journal*, vol. 29, no. 4, pp. 167-170, viewed 27 January 2021, <https://www.sciencedirect.com/>
15. Iyer, P, Aziz, K & Ojcius, DM 2020, „Impact of COVID-19 on dental education in the United States", *Journal of dental education*, vol. 84 no. 6, pp. 718-722, viewed 4 February 2021, <https://onlinelibrary.wiley.com/>
16. Adnan, M & Anwar, K 2020, „Online Learning amid the COVID-19 Pandemic: Students' Perspectives", *Online Submission*, vol. 2, no. 1, pp. 45-51, viewed 5 February 2021, <https://eric.ed.gov/>
17. Lou, Y, Bernard, RM & Abrami, PC 2006, „Media and pedagogy in undergraduate distance education: A theory-based meta-analysis of empirical literature", *Educational Technology Research and Development*, vol. 54, no. 2, pp. 141-176, viewed 18 January 2021, <https://link.springer.com/>
18. Gupta, R, Singh, N & Kumar, R 2017. „Longitudinal predictive validity of emotional intelligence on first year medical students perceived stress". *BMC medical education*, vol. 17, no. 1, pp. 1-6, viewed 23 January 2021, <https://link.springer.com/>
19. Sun, L, Tang, Y & Zuo, W 2020, „Coronavirus pushes education online", *Nature Materials*, vol. 19, no. 6, pp. 687-687, viewed 2 February 2021, <https://www.nature.com/>
20. Rees, EL, Quinn, PJ, Davies, B & Fotheringham, V. 2016, „How does peer teaching compare to faculty teaching? A systematic review and meta-analysis", *Medical teacher*, vol. 38, no. 8, pp. 829-837, viewed 28 January 2021, <https://www.tandfonline.com/>
21. Kennedy, DM & Fox, B 2013, „Digital natives": An Asian perspective for using learning technologies", *International Journal of Education and Development using Information and Communication Technology*, vol. 9, no. 1, pp. 64–79, viewed 1 February 2021, <https://www.learntechlib.org/>

22. Gui, M & Argentin, G 2011, „Digital skills of internet natives: Different forms of digital literacy in a random sample of northern Italian high school students", *New Media & Society*, vol. 13, no. 6, pp. 963–980. viewed 22 January 2021, <https://journals.sagepub.com/>

23. Säljö, R 2010, „Digital tools and challenges to institutional traditions of learning: technologies, social memory and the performative nature of learning", *Journal of Computer Assisted Learning*, vol. 26, pp. 53–64, viewed 4 February 2021, <https://onlinelibrary.wiley.com/>