Chapter 31
Benefits of Digital Education Over the Impact of Pandemic on Indian Higher Education System

Viney Dhiman, Anupama Bharti, and Gaurav Gaur

Abstract Education is a valuable aspect of society, but COVID-19 made a drastic impact on the education system. It necessitated a flexible approach among institutions, Teachers, and students. For managing education effectively, institutions have initiated to apply electronic mode in the education system and comparable features are available on many platforms. It is argued that students are not aware of such platforms and they also pass from Fear, Anxiety, and control addiction. Further, Focus upon Training of Teachers with the articulation of particular Curriculum is necessitated and also course has not designed in a different language to increase their reach and more opportunities for the youth of rural India. Low Internet interpretation demands much investment for making sufficient digital infrastructure and there are certain societal barriers to online education. Still, faith in private players' investment in education is not supported due to their profit-oriented nature. Present chapters attract the adoption of online education to respond to the recent pandemics, particularly in Higher Education in India. For this purpose, some factors of digitalization that are in use in Indian Universities try to evaluate based on static analysis of Factors Awareness, Anxiety, Network Issues, Problems of students are facing not having required technology along with language barriers. On the other hand Training of Teachers, and the process of online education at Indian University. The present chapter attracts, how managing Education in pandemic based on an empirical study regarding paramount factors of higher education in the Indian Universities.

V. Dhiman (✉)
Post Graduate Institute of Medical Education & Research, Chandigarh, India
e-mail: viney.pu@gmail.com

A. Bharti
Department of Sociology & Social Work, Himachal Pradesh University, Shimla, India

G. Gaur
Centre for Social Work, Panjab University, Chandigarh, India

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31.1 Introduction

Education and Information Technology: Currently, technology is being used to enhance, assist, or expand teaching, learning, and creative inquiry in higher education globally. Students may assist one another and collaborate to better grasp the subject thanks to technological advancements. The ability to act as (supervised) instructors is something that they can do on occasion, and learning via teaching is very beneficial for understanding a subject and solving issues. While using Technology learners can have better understand the academic material and they also become more knowledgeable and easily solve the problems related to education.

31.2 Important Aspects of Technology in Education

- Drastic development in skills
- An enabler of others to better teaching and learning practices particularly those residing in remote areas
- Demands capacity building of teachers in the tune of technological advancement
- Build a platform for a large number of teaching material
- It enhanced the probability for Educators to become imaginative, flexible, and willing to renew their vision of teaching and learning
- It called into question to continuous training of teachers
- Focus upon invention and use of computers in various areas
- Improves the quality of education and leads to parallel and vertical changes
- A learner can Supervise teachers.

31.3 Status of Higher Education in India

Higher education: It is out of the ordinary India is in Higher Education made drastic development. Details can be visualized in Table 31.1.

After independence, the growth has been very impressive. India is the largest higher education system in the world in the potential of having universities ad colleges and Table 31.1 shows 50 times increase in academic institutions. The Kothari

Table 31.1 Status of higher education in India

Status of higher education	Number of universities	Number of colleges	Students enrolment at tertiary level
Beginning of independence	20	591	0.2 million
After independence	504	25,951	

Table 31.2 Higher education student population growth

Years	2017–18	2018–19
Gross enrolment ratio	25.8	26.3
Enrolment in absolute term (in crore)	3.66	3.74
No. of university	903	993
Educational institutional	49,964	51,649

commission set up in 1964 had recommended that the government should spend at least 6% of its gross domestic product (GDP) on education. However, at present India is able to achieve only half the target. Furthermore, the Knowledge Commission also recommends an increase of at least one and a half percent of GDP for higher education [1–6].

Challenges of Higher Education: Demand–Supply Gap and low quality of education are normal phenomena in Higher education. According to a recent government report, two-thirds of India's colleges and universities are below standard in the matter of quality of education. It is shocking that Low expenditure in Research and Development adversely affected the quality of education (MHRD, 2009–10). On the other hand, a huge Faculty Shortage is usually seen at every educational institution. Although, Poor infrastructure and excessive Political interference have distorted the system. This provides the opportunity to think that How regulation is made to attract Private Investment in the social Infrastructure [8]. Moreover, the present system of education has not found its ancient prominence. Thus, it has been felt to integrate the education system with global players to secure efficient Human Resource Management.

Present Status of Higher Education: It is a notable fact that Gross Enrolment Ratio in Higher Education increased between the years 2017 to 2019, however in absolute terms this increase account for only 8 billion. In this case, the number of University it has also increased in the same periods. While looking upon educational Institutional it also viewed increased. Details are also provided in the Table 31.2 and Fig. 31.1.

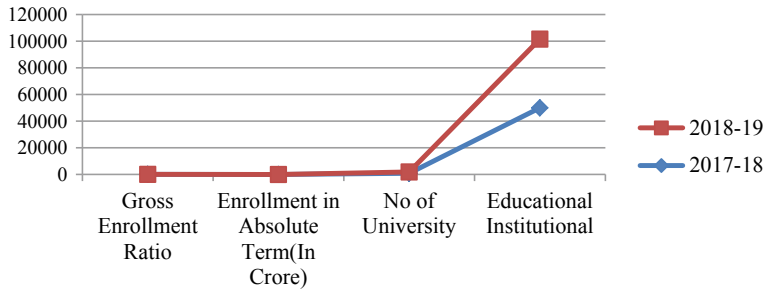

Fig. 31.1 Higher education student population growth

The second aspect attempt to explain the measure of how to convert pandemic into opportunity. In this sense, it is pertinent to mention here that a positive approach may have become fruitful in the exceptional situation while trying to control uncontrolled factors. At the same time, many administrative players report on how the situation may be understood and how teaching and learning can be continued. Politicians typically work with numerous professionals to deal effectively with the issue. Concerning social media, professionals and beginners may communicate their logical and irrational opinions [7–12]. Lockdowns, however, have numerous effects on pupils and underlie inequities as well as social and psychological stress. Parents and custodians of kids also had bad effects and tried to get engaged to improve the situation with social therapy and their children, especially those who are educated.

The third element shows how schools and instructors all around the globe transfer their labor from classrooms and classrooms to digital platforms. It also found flaws and weaknesses in this rapid shift. Here it is important to highlight that the scenario also offers business digital learning suppliers a new market opportunity. Thus, this reframing of policy along with the appropriate use and execution of private capital to initiate online education cannot be left out without stating [11, 13–17]. On social media, renowned experts have asked why some people, organizations, and businesses are so keen to provide advice and to consider whether they are motivated by commercial motives. Others caution that if the education system is placed in the hands of the capitalist entirely or without balance, undesirable results may be achieved [13, 14, 18–24]. However, in the form of monitoring the lives and dignity of students, online learning threatens privacy. Education becomes costly because of its business motivation when private actors are included in the education system. Pandemic also compels the educational organization, via the choice of the best alternative to the education technology, to consider ahead of time of the future problem. These decisions have to be adaptable in supporting the changing environment both for students and instructors. Educational organizations utilize previous knowledge and experience to overcome their shortcoming soon to minimize their potential negative effect [23–27].

Involvement of the Private Sector in Higher Education: Presumption about the economic success of the states is directly determined by their education systems now realized. The involvement of the private sector in higher education has grown drastically. Today over more than half of higher education institutions in India are promoted by the private sector. India has been the biggest institution of higher education in the world with student inscriptions at the second highest in the world in the past decade in particular [2].

Prominent Role of the Private Sector: At now, the private sector, which spans over and gives the appearance that it is continuously expanding quickly and that offers most of the training courses in the field of engineering and governance. There are many additional providers for laws except to enable them to join the area of education [6]. Despite increasing education expenditure, one-fourth of his population remains untrained; it is startling to discover that just 15% of Indian children finish high school and only 7% are graduates. The level of education is substantially low compared to the main developing countries of the globe, whether in elementary or higher education

in India. By 2008, post-secondary India had a vacancy of one-quarter of all teaching jobs throughout the country, and it is also a disadvantage that fewer than 60% of university teachers participating in higher education lack either a master's degree at the NET or Ph.D. (Newsweek, 2011). As of 2011, 152 engineering colleges in India have been awarded an annual study intake of five lakhs, 82 thousand, including 1214 polytechnics, and a total yearly intake of 65 thousand lakhs (science and technology education, 2009). These schools, however, also face a significant lack of faculties [8]. By concentrating on the number of universities and colleges, the central government and the state governments strive to foster talent. In the past 40 decades, the number of universities has risen more than six times and more than 30 times between 1970 and 2011.

31.4 Online Education

Efficacy of online education: Technological added education system supported in designing innovative course materials and widening highly interactive student–teacher relationships.

Significance of Online Education: Online education emerged as downward learning where teachers have to learn innovative ideas to compete with new challenges due to technological advancement in the present education system. It is assisted that there should use of ICT in the education system and curriculum copes with desire innovation to make learning as interactive sessions). Now the world is giving priority to using ICT in education to avail benefits of efficiency and cost-effectiveness in educational business [11]. Thus, the education system is inclined to reshape itself and articulated with modernization where digitalization with innovative ideas stapled with knowledge). However, significance can be underlined as under:

Challenges of Implementation of Online Education: The basic challenges in the higher education system in India are resistance to change, motivation levels of students, technical skills of students, students' understanding of technology, and How to check student performance.

Basic Components of Online Education: The use of ICT is dependent on certain pre-requisites and we can only proceed to digital education after fulfilling these fundamental infrastructure conditions. Below are some of the key peripheral components in digital classrooms: (1) Smart Boards (2) Class Room PC (3) Projectors (4) Internet Connectivity.

Important online learning applications and tools: The digitalization of education pushes the academic institution to use these platforms for overcoming the problems of materials, tutors and getting better professional knowledge such as:

Factors Promoting Online Education in India: Some of the factors without that India cannot be able to the advancement of digital education culled and mentioned as: (1) Customized platforms for adaptive learning (2) E-learning two-way talks (3) Mobile-based Learning (4) Video-based Learning If mobile learning increases, it is predicted that it would increase the total Internet traffic by 80%.

Adverse Impact of Online Education on Students: Using ICT in education give away to some extraordinary adverse effects on social life and it has been cited as: (1) Addiction (2) Obesity (3) Social Disconnect (4) Reduced Face-to-Face Interaction (5) Unwarranted Information at Tender Age (6) Declining Writing Skills (7) Increasing Incidents of Cheating (8) Declining Mathematical Skills.

Major Initiative of Government of India to Digitalization of Education: After assessing the worth of online education the Government planned to invest in the Digitalization of education and details may be identified in the upcoming Table 31.3.

Table 31.3 depicts that from 2016 to 2018 concentrated to spend 64,676 crores for upgrading the online mode of education. India's makeover from present to future is only possible if cognitive therapy would grow in people of the country.

COVID-19 and status of Education in India: The effect of the COVID-19 epidemic is seen in many sectors across the globe. India's education sectors are severely impacted. It has caused the lockdown to have a very negative impact on the lives of the kids. About 32 billion students ceased moving schools, all educational activities were halted. Thus, it has been observed that pandemics brought not only some adverse experiences but also provided an opportunity for the articulation of the Education system to respond to tragedy [8] The Indian Government has been monitoring the impact of Covid-19 in many stages and the 5.0 shutdown has been declared effective from 30 April, 1 June to 30 June 2020.

Table 31.3 Overall major initiatives in Digital India

Scheme parameter	Current status	Target	Deadline	Budget
Broadband for rural gram panchayat	20 k villages connected under NOFN (April 2015)	2,50,000 Gram Panchayats	December 2016	32 k crores Rs
Universal Access to Mobile Connectivity	42,300 uncovered (June 2015)	Uncovered villages	March 2018	16 k crores Rs
National Information & Infrastructure	Under SWAN, NKN and NOFN, SWAN has made operational 34 villages	Nation-wide	March 2017	15,686 crores Rs
Wi-Fi enabled university	1038 institute connected on NKN 368 institutes connected on NMEICT	Over 1500 institutes	N/A	790 crores Rs
Skill Training in small/town villages for the IT sector	N/A	1 crores student	5 years	200 crores Rs

Table 31.4 Digital initiatives of UGC & MHRD for higher education for the exchange of information during COVID-19

Digital platforms for learners			
E-GyanKosh	Gyandarshan	Gandhara	SwayamPrabha provides Massive Open Online Courses (MOOCs)
E-PG Pathshala	E-Adhyayan	E-Pathya	National Digital Library of India (NDLI)
E-Yantra	Education Software that is Free/Libre and Open Source	Virtual Labs	E-ShodhSindhu
Shodhganga	VIDWAN	National Educational Alliance for Technology (NEAT)	SAKSHAT

The Effect on Higher Education and the Pandemic: Covid-19 has seriously destabilized all schooling. Different activities such as admission, testing, entry testing, competition exams by different institutions stay postponed and the authorities are intended to do the digital examination. All instructors and pupils are tempted to become more technological know-how. With the assistance of numerous conference technologies, such as Skype, YouTube Live, Google Meet Facebook Live, WebEx, etc. the responsible agency has launched several guidance programs and inductive meetings and counseling tools in support of the students. This project has established an excellent virtual learning environment and motivated students to participate in online activities. Teachers and students increased the usage of WhatsApp, Google Drive, Telegram, Twitter, and other electronic media to share information (Table 31.4).

31.5 Education and Impact of Covid-19

Education India after COVID-19 and Problems: It has been observed that in India at the Graduate and Post Graduate Level there has been adoption e-Learning mode to continue the educational process. However, Students stumble upon various Social psychological, and technological such as depression anxiety, poor internet connectivity, and unfavorable study environment at home. Despite this, Students from remote areas and deprived sections have faced other typical problems. It called upon the adoption of a tech-education system to provide proper education to students [12]. Again pandemic allowed policymakers to establish the education system which encourages social-psychological articulated model which based upon provided underneath (Fig. 31.2).

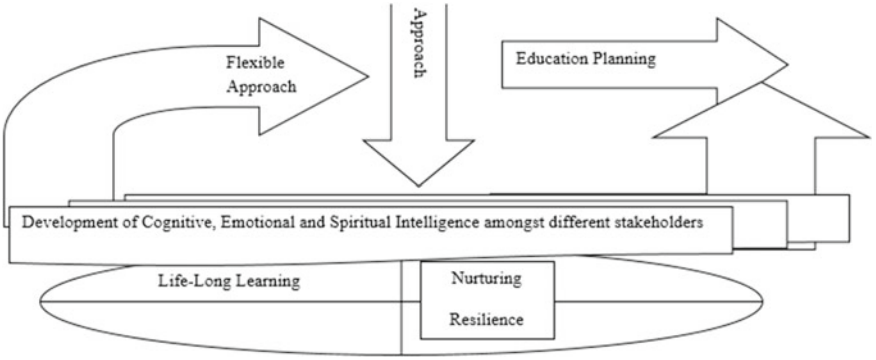

Fig. 31.2 Prerequisite of digital education

Internet penetration in India: Literature reveals that there is Low internet penetration in India as per requirement. There is also a gap visualized in Access Internet in Different sects, Gender and Regions, low frequency of electricity assisted with Network issues and low speed.

Reducing Investment in Digital Infrastructure: The funding for digital learning has been cut from Rs 604 crore in 2019–20 to Rs 469 crore in 2020–21. The main difficulty of remote learning is the difference in availability to PCs or cellphones from power and Internet connectivity. The Government of India has nonetheless made numerous initiatives to promote online education.

Recent UGC Guidelines: On 6th July 2020 University Grants Commission, UGC's Guidelines on University "Examinations and Academic Calendar" getting revised but the examination for final year students has not been canceled and decided to conduct by end of September 2020.

Judicial Intervention: Final Years Student Move to Supreme Court and rue cancelation of the examination. Supreme Court refused to give a stay on the examination but fixed the next hearing on 10 August.

31.6 University and Covid-19

Following the Lockdown, the University's teaching system is managed online. The authorities also encouraged instructors to use YouTube to broadcast lectures or presentations for pupils, and to respond to questions through video conferencing. It was also recommended that interactive meetings be held through Skype or Zoom. It has also been proposed that engineering courses utilize the National Program on Technology Enhanced Learning (NAPTEL) platform. They have completed an ongoing semester from the last week of March to 15th May 2020. At present only permanent faculty has been involved in teaching neither, contractual nor guest faculty have been involved still to teach an ongoing class. However, mid-semester students

have been promoted to the next class. This state of affairs unemployment will be reflected valuably felt in University as some faculty members regularly wait for their joining.

31.7 The Factors Have Been Analyzed at Indian University

1. **Awareness of students**: It has been observed that students were not properly aware of two online support system in education.
2. **Problems Faced by Student**: Again it has been brought to notice that students were faced with Anxiety, encountered Network Issues, and an issue they had not Smartphone and 75% of them felt bottleneck of Language Barriers.

Teachers' Responses: Teachers' responses regarding upgrading the university infrastructure have been actualized and it seems that it requires Training of Teachers, demands Change in Curriculum, and Development of Infrastructure to cope with new demands of Digitalization of Education.

31.8 Discussion

Education is a valuable aspect of society, but COVID-19 made a drastic impact on the education system. It necessitated a flexible approach among institutions, Teachers, and students [6]. For strengthening online learning commercial digital learning platform providers are also engaged. But this initiative left the question mark if capitalist circumferences to support the education system then will it promote education as per holistic human growth and open the route for education in the desirable future [4]. The pandemic paved the door for the adoption of various digital learning systems in education.

Drop-in sessions, free webinars, blog postings, and emergency policy papers were made available as a result of the unusual circumstances. Assisting learning from experience [4]. Thus, effective policy implementation and using private capital are paramount factors to set in motion online education. Further, private players if interested to invest in the support of online education then, it is also necessary to know whether their motivation is profit-driven or value precedes them to take such action. These decisions may result in new power and control relationships, new kinds of student unfairness, and other unanticipated outcomes.

Again, previous experiences should be correlated with the current model, and re-shuffling should be done as needed [7]. Thus, online learning should not be seen as a 'thing' or method in and of itself, and empirical research may provide a positive push. Furthermore, including instructors and learners in the creation, application, and practice of educational expertise may influence how well technology may promote successful teaching and learning.

Involvement of the Private Sector in Higher Education: The involvement of the private sector in higher education has seen drastic changes. Today more than half the higher education institutions in India are promoted by the private sector [2]. Compared to other major emerging countries, India's elementary and secondary education is of low quality [1]. However, in India, there is a bigger opportunity to Secure Private Investment. Thus, the time has come to integrate the education system with global players. Since independence, India has progressed significantly in terms of the Gross Enrolment Ratio (GER) [17]. Online education should be attentive toward both urban and rural areas and it also requires articulation with demands of the present state of affairs. The basic challenges in the higher education system in India are Social and Infrastructural resistance [5].

Benefits and Flipside of Digital Education over Traditional Education System: Use of digital mode in Education makes students Smarter, Self-Motivated, and More Accountable because it implied with Greater Involvement of Educators Parents Learning tools and technologies. Moreover, it not only facilitates Better Information Sharing measures but also Increasing Students' Employability and cross Geographical Limitations while including more students in the educational grip. While digitalization accelerating education in prompt away but it also left some adverse impact such as Addiction, Obesity, Social Disconnect, Reduced Face-to-Face Interaction, Unwarranted Information at Tender Age, Lack of Concentration SMS and text messaging has become a favorite pastime of many students, Declining Writing Skills, Increasing Incidents of Cheating and upmost rally round Declining Mathematical Skills [7]. In recent years India intent to make a huge expenditure to upgrade the online education system.

31.9 Solution

Based on the study followings solution may be culled out:

1. Awareness program for students and teachers regarding online Education facilitator
2. Counseling and social therapy to reduce fear, Anxiety and control addiction
3. Focus upon Training of Teacher with an articulation of particular Curriculum
4. Much investment for making sufficient digital infrastructure in the mode of Public–Private Partnership
5. Strategy for making an environment where socio and economical barriers can be minimized
6. Approach for convergence of offline education and online education in future
7. Adoption of Feedback versus Feed-forward technique
8. Acceptance of private investment in Online education
9. Adapting behavior and
10. Development of Community Participation.

Future Research: The study has been supported by primary data and statistical analysis was also made, but the sample size is very low. In future study problems of unemployment particularly for non-permanent teachers and students indebted due to loss of income of parents and too much cost required to go with online education can be conducted.

31.10 Conclusion

The following are the overall conclusions and highlights based on the research:

- The emphasis of this study was on the various implications of Covid-19 on higher education in India. The current epidemic has provided an opportunity to use technology-based learning at all levels of education. Post-Covid-19 education appears to be an alternative educational system that includes well recognized online/virtual education.
- In India, where students are unaware of the various platforms that aid online education, they are also anxious about how their performance will be rated, as well as poor Internet penetration and network concerns. Furthermore, due to their parents' indebtedness, students do not always have access to smartphones, and they occasionally face language hurdles.
- On the other hand, there is a need for teacher training and an imminent need for curriculum changes. Private player support can be used under strict conditions. As a result, policy for reducing fear, explaining bottlenecks with the cooperation of various stakeholders, and action should be determined with the joint efforts of the government, students, teachers, and parents, and ultimately the community's support would make it possible, and it cannot succeed without the use of information and communication technology.

References

1. Jena, P.K.: Challenges and opportunities created by Covid-19 for ODL: a case study of IGNOU. Int. J. Innov. Res. Multidiscip. Filed **6**(5), 217–222 (2020); Jena, P.K.: Impact of pandemic COVID-19 on education in India. Purakala 31(46):142–149 (2020)
2. UNESCO: COVID-19 Educational Disruption and Response. Retrieved on 3 June 2020
3. Apte, J.: The challenge of (online) education in India during the COVID-19 pandemic. Opinion South Asia, May 29, 2020. Retrieved From https://www.statecraft.co.in/article/the-challenge-of-online-education-in-India-during-the-covid-19-pandemic
4. Balachander, K.K.: Higher education in India: Quest for Equality and Equity. Mainstream.
5. Bates, T., Sangrà, A.: Managing Technology in Higher Education: Strategies for Transforming Teaching and Learning. Jossey-Bass, San Francisco (2011)
6. Bosamia, M.P.: Positive and Negative Impacts of ICT in our Everyday Life. Accessed from https://www.researchgate.net/publication/325570282

7. Bourdieu, P.: Distinction. A Social Critique of the Judgement of Taste (Trans. R. Nice). Harvard University Press, Cambridge, MA (1984)
8. Byker, E.J.: ICT in India's elementary schools: the vision and realities. Int. Educ. J. Compar. Perspect. **13**(2), 27–40 (2014)
9. Rashmi, R.: Challenges of quality in online learning, 6th May. Retrieved From https://timesofindia.indiatimes.com/blogs/edutrends-india/challenges-of-quality-in-online-learning/
10. Manthalkar, R., Gajre, S., Joshi, Y.: Education after COVID-19 Disruption (No. 3431). EasyChair (2020)
11. Nanda, A.: Information and Communication Technology, 1st edn. NGO Prints, Calicut (2005)
12. Dangwal, K.L., Singh, S.P.: Enhancing spiritualism in virtual world. Turkish Online J. Dist. Educ. **13**(2), 76–83 (2012)
13. Farrukh, S., Singh, S.P.: Teachers attitude towards use of ICT in technical and non-technical institutes. J. Educ. Soc. Res. **4**(7), 153 (2014)
14. Pardeep, T.: Role of ICT in professional development of teachers. Learn. Commun. **6**(1), 127–133 (2015)
15. Arulsumy, S., Sivakumar, P.: Application of ICT in education. Neelkamal Publications Pvt. Ltd. Hyderabad First Edition (2009)
16. Kumar, D.N.S.: Impact of COVID-19 on Higher Education. Retrieved on 25 May 2020
17. Jogan, S.N.: Higher education in India: a vision of 2030. Online Submission **6**(7), 365–370 (2019)
18. Venna, S.K.: Teacher education some qualitative consideration. Shikshak–ShikhaShodhPatrika **04**(1), 10 (2010)
19. Hiremath, S.S.: Current scenario of higher education in India: reflections on some critical issues. IRJSSH **1**, 73–78 (2017)
20. Editorial: e-Social work and digital society: re-conceptualizing approaches, practices and technologies. Eur. J. Soc. Work **21**(6), 801–803 (2018)
21. Fuchs, C.: Communication and Capitalism: A Critical Theory. University of Westminster Press, London (2020)
22. Gupta, D., Gupta, N.: Higher education in India: structure, statistics, and challenges. J. Educ. Pract. **3**(2) (2012)
23. St. Amour, M.: Privacy and the online pivot. Inside Higher Ed, 25 March (2020). https://www.insidehighered.com/news/2020/03/25/pivot-online-raises-concerns-ferpa-surveillance. Accessed 19 April 2020
24. Harwell, D.: Mass school closures in the wake of the coronavirus are driving a new wave of student surveillance. Washington Post, 1 April (2020). https://www.washingtonpost.com/technology/2020/04/01/online-proctoring-college-exams-coronavirus/
25. Herrington, J., Reeves, T.C., Oliver, R.: A guide to authentic e-learning. Routledge, London (2010)
26. Hodges, C., Moore, S., Lockee, B., Trust, T., Bond, A.: The difference between emergency remote teaching and online learning. EDUCAUSE Review (2020). https://er.educause.Edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning. Accessed 19 April 2020
27. Howland, J.L., Jonassen, D.H., Marra, R.M.: Meaningful Learning with Technology, 4th edn. Pearson Education, Boston (2011). https://en.unesco.org/covid19/educationresponse