



An Assessment of Undergraduate Students' Preference for Digital Learning Programmes During Covid-19 Pandemic Experience in Nigeria

Adeola Kiadese Lukmon¹ & Adedayo, Temitayo G².

¹Tai Solarin College of Education, Omu-Ijebu, PMB 2128, Ijebu-Ode, Ogun State, Nigeria.

²Department of Economics, School of Arts and Social Sciences, Tai Solarin College of Education, Omu-Ijebu, PMB 2128, Ijebu-Ode, Ogun State, Nigeria.

Corresponding Author: kiadeselukman@gmail.com

Abstract

This study assessed undergraduate students' preference for digital learning programmes during COVID-19 pandemic experience in Nigeria using descriptive survey research design. A total of 1230 undergraduate students selected through simple random sampling technique from all private and public universities in Ogun State, Nigeria, participated in the study. The data for the study, obtained using questionnaire, were analysed using frequency counts, percentages, and mean statistical analysis. The results showed that mobile learning is the most preferred digital learning programme by undergraduates during COVID-19 pandemic closely followed by distance learning. It was also discovered that lack of electricity supply, data to access internet, technical support services to fix and address problems encountered during usage and poor network connectivity among others are part of the challenges witnessed during the digital learning programme. The study recommends the provision of ICT facilities/devices for digital learning, recruitment of technical support personnel, provision of free data to access digital learning programmes amongst others.

Keywords: Digital Learning, COVID-19 Pandemic, Mobile Learning, Electronic Learning, Distance Learning

Introduction

COVID-19 is a menace that has bedevilled and ravaged the world in many ways. It has retarded the economy, ravaged health system, and disrupted socio-political interaction. This epidemic is caused by severe acute respiratory syndrome coronavirus. The outbreak was first identified in Wuhan, China in December, 2019. The World Health Organisation (WHO) declared the outbreak a public health emergency of international concern on 30th January, 2020 and a pandemic on 11th March, 2020. As of 6th June, 2021, more than 175,185,477 million cases of COVID-19 have been reported in more than 188 countries and territories, resulting in more than 3.7 million deaths: more than 156 million people have recovered (Richardson, 2021). The virus primarily spread among people during

close contact, most often via small droplets produced by coughing, sneezing, and talking. The droplets usually fall to the ground or onto surfaces before travelling through the air over long distances. Less commonly, people may become infected by touching a contaminated surface and then touching their face (Richardson, 2021).

Sequel to the rising concerns about the spread of COVID-19 and the need to contain the virus, a growing number of tertiary institutions have shut down in regards to conventional classroom lecture delivery (Ali, 2020). This is due to the fact that a major strategy in the containment of coronavirus was the imposition of lockdown measures which automatically



restrained people from partaking in interactive social activities. This situation has particularly been a great challenge to the education system across the world. Globally, the educational sector has never witnessed such a disruption in a colossal manner before (United Nations Education Scientific and Cultural Organisation (2002a). COVID-19 posed serious consequences for students by depriving them of their fundamental right to education and exposing them to the risk of child labour, early marriage, exploitation, and poor academic abilities (Baytiyeh, 2020).

As reported by UNESCO (2020a), more than 1.5 billion students globally which represent 87% of the global student population, were deprived of education. More worrisome is the threat of extended closure which paved way for the need to rethink traditional teaching (UNESCO, 2020). To assist students at home during the lockdown, many tertiary institutions in Nigeria started experimenting with some digital learning programmes to help students learn while at home. Some of the institutions make use of e-learning, some m-learning, and some d-learning respectively (Tabor, Sharon & Spring, 2020).

Contextually, Holzberger, Phillip and Kunter (2013) regarded digital learning as delivery with digital forms of media such as texts or pictures through the internet in order to enhance learning, improve teaching effectiveness, promotes personal knowledge and skills. This implies that digital learning is meant to enhance learning by exploring new technologies and applying them to the learning context and not rely on digital means of instruction delivery. Explaining further, Antfila, Valimak, Hatonen, Luukkala and Kaila (2012) opined that digital learning is a digital tool used to acquire digital teaching materials for online or offline learning

activities through wired or wireless networks. Therefore, digital learning is an instructional practice that ultimately helps students through various digital means such as the internet, corporate network, computers, satellite broadcasting, audio-tapes, video-tapes, interactive television, compact disk among others. These media are applied in a broad range of enhanced educational strategies including e-learning, mobile learning, distance learning, blended learning, computer-based learning, virtual classrooms, digital cooperation, and other strategies that rely on digital tools (Lauren, 2020). According to Bao (2020), some universities such as Harvard, MIT, Yale, Oxford, Cambridge, Tsinghua, Peking University, among others are permanently moving in this direction.

e-Learning is an umbrella term that describes learning done with the use of a computer, usually connected to a network. It provides an opportunity to learn as it eliminates the challenges of distance and the needs to commute. Distance is eliminated because e-learning content is designed with media that can be accessed from properly equipped terminals and other means of internet accessibility (Kumar & Bajpai, 2015). According to Rogers (2018), e-learning has a competitive advantage as well as positive impacts on students' performance and many universities have implemented it.

e-Learning is known as web-based learning, on-line learning, distributed learning, or internet-based learning. It is primarily a web-based system of education that makes information or knowledge available to users, or learners, on the whole, e-learning disregards geographical proximity (Udjo & Amal, 2018). E-Learning attempts to shift the forms of academic environment away from the physical teacher-student environment while disseminating information without concern to distance; instructors utilize new



and improved web-based technologies to plan and structure teaching materials (Clark & Mayer, 2018).

Empirically, Manya, Vishnu & Gayathri (2018) ascertained the positive effect of e-learning on the academic performance of undergraduate students. Kassahun (2014) in a quasi-experimental study also reported a positive effect of e-learning on students' academic performance.

Mobile learning is also known as m-learning, u-learning, learning while mobile, hand-held learning, anytime, anywhere, ubiquitous learning, and personalised learning (Behera, 2013). It is an instructional strategy that is conducted on and delivered through portable devices such as tablets, personal digital assistants (PDAs), and smart-phones. It is a system designed to obtain or provide digital learning assets which include any form of media or content made available on a personal device such as smart-phones and tablets. Mobile learning is characterised by handheld and wireless devices (Motiwalla, 2007) which help to eliminate limitations of space in which teaching and learning processes can be extended beyond the classroom. Hence, mobile learning provides a conducive learning environment for a dependable educational alternative with the use of mobile devices (Motiwalla, 2007).

Mobile Learning is defined as an integral part of e-learning that uses learning connected to a mobile device based on the mobility of learning, mobility of learners, and mobility of technology that assisted the teaching-learning process. Initially, mobile phones are mainly used totally for communication purposes, but recently, it has started to be used in core pedagogical activities in educational instruction. Mobile learning is an anytime-and-anywhere mode of learning which involves instantaneous access to personalised content with tools and resources such as i-

pads, smart-phones, and tablets in order to create new knowledge, satisfy learners' curiosity, collaborative learning with others, and enhance learning experiences. It promotes flexibility of learning, personalised content, and acquisition of skills, knowledge, information, and a positive attitude towards learning which enables learners to see the entire world as a single classroom (Omiola & Ojeleye, 2020).

Chen (2020) indicated that, in a study about mobile device usage, more than half of college students utilized a mobile device for academic purposes. Eighty-two percent of students that owned a tablet device reported using the device for academic purposes while only 68% of students that owned a smart-phone used their device for academic purposes. The study also indicated that there was a positive relationship between students' cumulative grade point average (CGPA) and academic use of the smart-phone.

Distance learning is a system of education characterised by the physical separation between the teacher and the learner in which instruction is delivered through a variety of media including print and other ICTs to learners who may either have missed the opportunity earlier in life or have been denied face-to-face formal education due to socio-economics, career, family and other circumstances (Jegede, 2003).

Jegede (2003) defined distance learning as education provided by a mode other than the conventional face-to-face methods whose goals are similar to and just as noble and practical as those of campus full-time face-to-face education. Generally, distance learning has peculiar characteristics as identified by Association for the Development of Education in Africa (ADEA) working group on distance education and open learning (2002). These characteristics are: use of varieties of



media and ICT for instructional delivery and the provision of two-way communication to ensure tutor-learners and learners and learner interaction.

The revised National Policy on Education (Federal Republic of Nigeria, FRN 2004) detailed that the goals of distance education should be to:

- i. provide access to quality education and equity in educational opportunities for those who otherwise would have been denied.
- ii. meet the special needs of employers by mounting special certificate courses for their employees at their work-place.
- iii. encourage internationalisation especially of tertiary education curricula.
- iv. ameliorate the effect of internal and external brain drain in tertiary institutions by utilizing Nigerian experts as teachers regardless of their locations or place of work.

To achieve these goals, it is stated that the Federal Government of Nigeria shall ensure that distance learning is equivalent in structure and status to those offered by face-to-face mode of instruction, and that government shall encourage and regulate distance education in Nigeria.

The theoretical framework of this study is based on the theories of independence/autonomy and constructivist learning theory. The theories of independence and autonomy were propounded between late 1960 and early 1970 by Rudolf Marfred Delling, Charles A. Wedemeyer and Mitcheal G. Moore. The theory of independence according to Delling (2007), emphasized the reduction of the roles of both the teachers and the educational organisations to a minimum and pushes more on the independence and autonomy of the learners. The function of the educational institution is to

take over, upon the wish of the learners, everything they cannot yet do for themselves, with the tendency that the learners eventually become autonomous. The only function left for the educational institutions is to provide information, subject matter content, documentations, and library facilities. The learner, therefore, is compelled to accept a comparatively high degree of responsibility for the conduct of the learning programmes, because he or she is alone. He/she also exercises a greater degree of control over his/her learning. By being autonomous therefore calls for effective self-regulations skills on the part of the learners. This becomes necessary so as to be able to control and regulate their learning since they are the ones dictating the pace, and almost everything about their educational programmes.

Constructivist learning theory by Vygotsky (1978), states that every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level. In other words, it appears first, between people (inter-psychological) and then inside the child (intra-psychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts as the higher function originates as an actual relationship between individuals. The theory focuses on the learner, and providing opportunities to build his knowledge through active interaction and mental processes. In constructivist theory, emphasis is placed on social interaction, the relationship among activity, skills, thought, cultural and historical activities in an individual commonly which affect what learners acquire (Lebow, 1993). The theory sees learners as active rather than passive with emphasis on knowledge construction on learner autonomy and digital learning which allows learners to displace the trainer at the centre of the learning



experience, and take more responsibility for their learning.

The COVID-19 protocol which emphasise social distancing has opened up the need for digital learning which has before now been in neglect and abandoned owing to the deplorable state of infrastructure and educational sectors. Therefore, the level of digital learning in Nigeria is still at low ebb due to resistance to change from traditional pedagogical methods to more innovative, technology-based teaching and learning methods by the educational sector. Although, many institutions have started synthesizing learning a lot of them are still stuck with old procedures (Dhawzn, 2020). This is not far connected from the fact that there is inadequate ICT infrastructure, the educational sector is underfunded, poor and limited expertise, lack of effective coordination of the various ICT for education initiatives as well as the over-dependence of educational institutions on government (Adke, 2008).

The main purpose of this study is to assess undergraduate students' preference for digital learning programmes during the COVID-19 lockdown experience in Nigeria. The study specifically examined undergraduate students' preference among the three modes of learning (e-learning, m-learning, and d-learning) and challenges in accessing lessons delivered using e-learning, m-learning, and d-learning and suggested possible solutions to the challenges identified in using e-learning, m-learning, and d-learning.

Research Questions

The following questions were raised and answered in the study;

1. What is the digital learning modes preferred by undergraduate students among e-learning, m-learning, and d-learning during the COVID-19 experience?

2. What are the possible challenges undergraduate students have in accessing lessons delivered from e-learning, m-learning, and d-learning during the COVID-19 experience?
3. What are the possible solutions to the challenges identified in assessing lessons delivered from e-learning, m-learning, and d-learning during the COVID-19 experience?

Methods

The descriptive survey research design was adopted in this study. The population comprised all the undergraduate students in public and private universities in Ogun State, Nigeria. One thousand and two hundred and fifty (1, 250) undergraduate students selected through a simple random sampling technique participated in the study. The instrument used for data collection was a questionnaire designed and validated by the researchers. The instrument has two main sections. The first section deals with the bio-data of the respondents; while the second section consists of pertinent questions related to the research questions raised in the study. The instrument was given to four educational technologists and two measurement and evaluation experts for their scrutiny and face validation of the instrument. The criticism and suggestions of the experts were accommodated in the final draft of the instrument before the administration of the questionnaire. It was pilot-tested using 100 level undergraduate students in Lagos State using the test-retest technique. The instrument, using Pearson Product Moment Correlation test, yielded a reliability coefficient of 0.86. The administration of the instrument was done by the researchers with the support of seven research assistants who were given orientation about the purpose of the



study. Out of the 1250 copies of the questionnaire administered, only 1230 were returned. The data from the study were analysed using descriptive statistics frequency count, percentages, and mean and thus, answered the research questions raised in the study.

Data Analysis

Research Question One: What is the digital learning mode preferred by undergraduate students among e-learning, m-learning and d-learning during COVID-19 experience?

Table 1: Frequency, Percentages and Mean Showing the Learning Mode Preferred by Undergraduate Students (N = 1230, acceptable Mean = 2.50, S.D. = 1.29)

Statement	A	SA	D	SD	Mean	S.D.	Decision
E-learning is the most preferred learning mode during COVID-19 pandemic experience	247 (20.1%)	132 (10.7%)	446 (36.3%)	405 (3.9%)	2.18	1.09	Disagree
M-learning is the most preferred learning mode during COVID-19 pandemic experience	413 (33.6%)	413 (33.6%)	202 (16.4%)	202 (16.4%)	2.84	1.06	Agree
D-learning is the most preferred learning mode during COVID-19 pandemic experience	273 (22.2%)	189 (15.4%)	426 (34.6%)	342 (27.8%)	2.32	1.10	Disagree
None of the e-learning, m-learning and d-learning are preferred learning mode during COVID-19 pandemic experience	171 (13.9%)	94 (7.6%)	621 (50.5%)	344 (27.9%)	2.07	0.95	Disagree

Using the grand mean, 2.50 and S.D. = 1.29 as benchmark, the result in Table 1 revealed the most preferred digital learning mode among the sampled undergraduates. According to Table 1, M-learning with mean (M = 2.84, S.D. = 1.06) was the most preferred learning mode by the undergraduates during the COVID-19 pandemic. The other digital learning modes (e-learning and d-learning) recorded mean scores below the benchmark. M-learning mode also recorded the highest frequency (67.2%) of

undergraduates who agreed and strongly agreed with the statement that the learning mode is their most preferred during and after the COVID-19 pandemic experience.

Research Question Two: What are the possible challenges undergraduate students have in accessing lesson delivered from e-learning, m-learning, and d-learning during the COVID-19 experience?

Table 2: Frequency, Percentages and Mean Showing the Challenges Undergraduate Students have in Accessing Lessons Delivered from E-learning, M-learning and D-learning (N = 1230, acceptable Mean = 2.50, S.D. = 1.29)

Statement	A	SA	D	SD	Mean	S.D.	Decision
Power supply is one of the major issues when using e-learning, m-learning and d-learning	356 (28.9%)	438 (35.6%)	221 (17.9%)	215 (17.5%)	2.76	1.05	Agree
Lecturers and undergraduate students interactions is not effective when using e-learning, m-learning and d-learning	474 (38.5%)	308 (25.0%)	227 (18.5%)	221 (18.0%)	2.84	1.12	Agree
Network problem post a lot of serious issue when using e-learning, m-learning and d-learning	311 (25.3%)	484 (39.3%)	239 (19.4%)	196 (15.9%)	2.74	1.01	Agree



Content of courses are not systematically presented when using e-learning, m-learning and d-learning	331 (26.9%)	412 (33.5%)	266 (21.6%)	221 (18.0%)	2.69	1.05	Agree
Voice of the content presenter is not audible enough when using e-learning, m-learning and d-learning.	247 (20.1%)	84 (6.8%)	380 (30.9%)	519 (42.2%)	2.04	1.14	Disagree
Practical aspects of the course content are difficult to understand when using e-learning, m-learning and d-learning.	313 (25.4%)	468 (38.0%)	228 (18.5%)	221 (18.0%)	2.71	1.04	Agree
Lecturers lack knowledge of proper design and development of e-learning, m-learning and d-learning	413 (33.6%)	413 (33.6%)	202 (16.4%)	202 (16.4%)	2.84	1.06	Agree
Facilities and devices to use for e-learning, m-learning and d-learning are not easy to get	440 (35.8%)	354 (28.8%)	215 (17.5%)	221 (17.9%)	2.82	1.10	Agree
Money to subscribe for data when using e-learning, m-learning and d-learning is a problem	475 (38.6%)	306 (24.9%)	228 (18.5%)	221 (18.0%)	2.84	1.12	Agree
No technical staff to solve problems encountered when using e-learning, m-learning and d-learning	481 (39.1%)	311 (25.3%)	196 (15.9%)	242 (19.7%)	2.84	1.14	Agree

The result in Table 2 revealed possible challenges undergraduates encountered in accessing lessons delivered via e-learning, m-learning, and d-learning modes during the COVID-19 experience. The result showed that potent challenges included: epileptic power supply ($M = 2.76$, $S.D. = 1.05$), ineffective interactions among lecturers and students ($M = 2.84$, $S.D. = 1.12$), network problem ($M = 2.74$, $S.D. = 1.01$), none systematic presentation of course content when using the learning modes ($M = 2.69$, $S.D. = 1.05$), difficulty in understanding the practical aspects of the course content ($M = 2.71$, $S.D. = 1.04$), lack knowledge of proper design and development of the learning modes among lecturers ($M = 2.84$, $S.D. = 1.06$), problem of getting facilities and devices to

use for the learning modes ($M = 2.82$, $S.D. = 1.10$), lack of money to subscribe for data when using the learning modes ($M = 2.84$, $S.D. = 1.12$) and lack of technical staff to solve problems encountered when using the learning modes ($M = 2.84$, $S.D. = 1.14$).

According to Table 2, the only challenge the respondents disagreed with is that the voice of the content presenter is not audible enough when using the learning modes.

Research Question Three: What are the possible solutions to the challenges identified in assessing lessons delivered from e-learning, m-learning, and d-learning during the COVID-19 experience?

Table 3: Frequency, Percentages and Mean of Solutions to Challenges Undergraduate Students' Have in Accessing Lessons Delivered from E-learning, M-learning and D-learning (N = 1230, acceptable Mean = 2.50, S.D. = 1.29)

Statement	A	SA	D	SD	Mean	S.D.	Decision
The government needs to provide adequate facilities and devices for both lecturers and undergraduate students in the Universities.	440 (35.8%)	354 (28.8%)	215 (17.5%)	221 (17.9%)	2.82	1.10	Agree
Staff providing technical services need to	330	437	252	211	2.72	1.04	Agree



be recruited in the school to help both the lecturers and the undergraduate students	(26.8%)	(35.5%)	(20.5%)	(17.2%)			
The government needs to make room for free data or internet service for both lecturers and undergraduate students	354 (28.8%)	440 (35.8%)	221 (17.9%)	215 (17.5%)	2.76	1.05	Agree
Lecturers need to be properly trained on how to design and present e-learning, m-learning and d-learning.	482 (39.2%)	311 (25.3%)	196 (15.9%)	241 (19.6%)	2.84	1.14	Agree

The result in Table 3 revealed possible solutions to the challenges identified by the undergraduate respondents in assessing lessons delivered via e-learning, m-learning, and d-learning modes during and after the COVID-19 pandemic. Among others, the solutions proffered include: the need for government to provide adequate facilities and devices for both lecturers and students, the need to recruit staff with technical services competence in the schools to help both lecturers and students, the need for government to provide free data and internet services for both lecturers and students, and the need to train lecturers on how to design and present e-learning, m-learning, and d-learning modes.

Discussion

The outcome of the study revealed that the most preferred digital mode of learning during the COVID-19 pandemic experience is mobile learning followed by distance learning. The rationale for this may be as a result of easy access to mobile devices at the disposal of the teachers and the students. Many of the students have their handset and other portable PDAs that could be used to access mobile learning course content and for effective interaction between student to student and between teachers and students. Also, there is radio/television set in virtually every home that will make room for students to access distance learning/instructional radio/television programmes but computer and internet

connectivity are the major challenges for using e-learning. The finding agrees with the finding of Wang (2004) on mobile learning which opined that mobile learning can be used to support traditional learning as well as distance learning. This finding is contrary to the finding of Abubarka, Karima, Murtala and Bisher (2018) on media preference among students of Kano State Polytechnic, Nigeria which reported that the majority of the students preferred internet or electronic learning.

The findings of this study also revealed that power supply, teachers' and students interaction, network connectivity problem, course content not systematically presented, difficulty in understanding the practical concept, teachers' lack of proper design and development, lack of facilities and device, lack of fund to subscribe for data and lack of technical staff to address and solve the challenges encountered during the use of electronic learning, mobile learning, and distance learning are part of the challenges encountered except that of the voice of the presenter that was clear and audible during the content presentation.

Without gainsaying, it is obvious that all the above-mentioned challenges are issues to be addressed among others to ensure effective use of e-learning, m-learning, and d-learning. These challenges are of course real and visible to all. The epileptic and irregular power supply is a hidden fact in Nigeria. COVID-19 affected the economy adversely, many businesses were shut/closed or experienced low

patronage and getting money for data subscriptions became difficult.

Many homes and tertiary institutions did not have the facilities to access e-learning, many undergraduate students did not have android and smart-phones that could be used to access mobile learning and many students did not have access to technical support services when experiencing various challenges during the COVID-19 period.

The finding equally indicated possible solutions to the challenges encountered to include government intervention in providing adequate facilities and devices for both lecturers and students, making provision for technical staff to fix the problem encountered, making room for free data for both lecturers and students, and also exposing lecturers to capacity building workshop on e-learning, m-learning, d-learning, instructional design, and development as well as presentation as part of the possible solution to the challenges encountered when using digital learning intervention during COVID-19 pandemic experience.

The researcher strongly believed that if the government is ready to provide regular electricity, recruit qualified ICT technical staff, ready to provide funds for procuring necessary facilities for e-learning, and make provision for free data to use the internet, many of the identified challenges will be reduced.

Conclusion

Mobile learning stands out as the preferred learning mode among e-learning, m-learning, and d-learning modes during the COVID-19 pandemic lockdown classes in private and public universities in Ogun State, Nigeria. Although, there are some challenges like teachers' and student interaction issues, electricity supply, lack of technical staff, and so on.

Recommendations

1. Government should provide adequate ICT facilities and devices to encourage the use of e-learning, m-learning, and d-learning in tertiary institutions in Nigeria.
2. Government, corporate bodies, parents should make provision for the necessary ICT devices such as laptops, i-pads, mobile phones, and free data to encourage and stimulate the use of e-learning, m-learning, and d-learning in and out of the school environment.
3. Technical staff to address and fix the challenges encountered during the use of e-learning, m-learning, and d-learning should be recruited to assist in the schools.

References

- ADEA Working group on distance education and open learning (2002). open and distance learning in sub-sahara Africa. *Reduit*, 5(3), 26-40
- Aduke, A. F. (2020). Usage and challenges of information and communication technology in teaching and learning in Nigerian Universities. *Asian Journal of Information Technology*, 7(7), 290-295
- Anttila, M., Valimaki, M., Hatonen, H., Luukkanla, T. & Kaila, M., (2012). Use of web-based education sessions on Psychiatric Wards. *International Journal of Medical Informatics*, 81(6), 424-433
- Bao, W. (2020). COVID-19 and on-line teaching in higher education: A case study of Peking University. *Human Behaviour and Emerging Technologies*, 2(2), 113-115
- Batra, S. K. (2013). Meaning and concepts of social media. *International Journal of Science Education*, 11(2), 373



- Chen. G. (2020). Mobile learning and students academic achievement. *Journal of Educational Research and Learning* 5(3), 46-52
- Federal Republic of Nigeria (2004). *National Policy on Education* (4th Edition). Lagos: NERDC Press
- Holzberger, D. Phillip, A. & Kunter, M. (2013). How teachers' self-efficacy is related quality: A longitudinal analysis. *Journal of educational psychology*, 105(3), 774-786
- Jegede. O. J. (2003). Evolving a national policy on distance education: An agenda for implementation. *Education Today*, 8(3), 14-29
- Lauren, D. (2020). Digital learning. What to know in 2020. Retrieved from <http://www.schology.com/blog/digital-learning>
- Letow, D. G. (1993). Constructivist values for instructional system design: five principles towards a new mind-set. *educational technology research and development*, 41(3), 4-16
- Motiwalla, L. F. (2007). Mobile Learning: a framework and evaluation. *Computer and Evaluation*, 49, 581-596
- Richardson, H. (2021). Whose children will still be able to go to school? BBC News. retrieved 2021-6-21
- Tabor, Sharon, W. Spring (2020). Narrowing the distance: implementing a hybrid learning model. *Quarterly Review of Distance Education*. IAP, 8(1), 48-49.
- UNESCO (2020a). COVID-19 Educational disruption and response. Retrieved from <http://en.unesco.org/COVID-19/educationresponse>
- UNESCO. (2020b). UNESCO COVID-19 Education response: virtual knowledge sharing workshop on distance education programmes using radio and television. www.unesdoc.unesco.org
- Vygotsky, L. S. (1978). *Mind in sonety: the development of higher psychological process*. London: Harvard University Press.