FOLIA 343

Annales Universitatis Paedagogicae Cracoviensis

Studia ad Didacticam Biologiae Pertinentia 11 (2021)
ISSN 2083-7276
DOI 10.24917/20837276.11.12

Tetyana Borova, Viktoriia Petrenko

E-learning in HEI education process: challenges and opportunities

Introduction

The present transformation of higher education refers to a postmodern age characterized with the extraordinary, rapid changes taking place in the world, through globalism, space-time compressions, science/technology advances, modifications of self and identity, and terrorism (Bloland, 2005). Higher education was expected to provide everyone with easy access to education through distance education due to globalism and information technology involved in all aspects of knowledge creation, dissemination, and application (Bloland, 2005, p. 128). Saba and Shearer (2018) claimed that higher education had failed to meet the demands of a knowledge-saturated society. According to the authors, the roots of this failure are in replicating in-personal education during on-line teaching neglecting learner–centered model of the post–modern school since higher educational institutions (hereinafter - HEIs) "have one foot in the modern industrial era and another in the emerging postmodern epoch" (Farhad Saba and Shearer, p. xxiii).

Due to the changes induced by the COVID-19 epidemic, some measures taken to keep social distancing have been applied to education and forced HEIs to transit to distance education (hereinafter - DE) and e-learning. It should be noted that a total sudden transition to distance learning has coined the new term emergency (crisis) e-learning that is aimed at providing access to education and "is a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances" (Hodges et al., 2020).

The aim of the paper is to analyze the challenges faced by teachers and students who had to switch to distance education during COVID-19 epidemic disease period and the strategies used to cope with the challenges in distance education. Thus, the following questions arise: 1. What are the challenges of DE forms faced by the participants? 2. What are the factors needed to be considered before implementing e-learning in the HEI educational process? 3. What are the strategies of the participants to cope with the difficulties they encounter in DE?

Literature Review

Although HEIs already had extensive experience in DE, a massive and rapid change from conventional well-designed in-person learning to digital transformation has revealed some of the challenges experienced by students and lecturers in e-learning.

From the perspective of the challenges faced by teachers in Poland, Tomczyk and Walker (2021) state that crisis e-learning might be characterized by a chaotic nature; replication of teaching methods and forms; rapid speed of implementation supported with low level of technical assistance; problems concerning teacher–student interactions (fraud, plagiarism, digital exclusion, etc.); problems with parents; searching for free or readily-available methodological solutions in material delivery mediated by new media.

Based on the review and qualitative analysis of the scientific and educational literature, scientists Zawacki-Ritzgter, Batsker and Vogt (2009) identified three meta-levels that highlight the current research fields and underpin the understanding of the concept "distance learning" by scholars: 1. macro level: systems and theories of DE (access to DE, equality in access to DE, ethical issues, globalization of education and cross-cultural issues, systems and institutions of DE, theories and models of DE, research methods in DE and knowledge transfer); 2. meso-level: management of DE, organization and technologies of DE (economic issues, DE efficiency, educational technologies, innovations, technical support services for those who study in the DE format, quality assurance of DE); 3. micro-level: teaching and learning in distance education (DE system design, interaction and communication in DE, characteristics of participants).

The analysis of the studies produced by scholars provide evidence that they have documented challenges of DE forms of educational experience at all levels. Scholars and stakeholders of education are concerned about such topical issues:

- prerequisite issues: cost and access to the Internet – the network instability or the lack of access or inappropriate access to the Internet, especially, for students living in rural areas; infrastructure deficiency – the absence or the low capacity of the available HEIs educational platforms, lack of adequate technical equipment, or the lack of technical assistance; bias towards distance education and e-learning (Nenko, Kybalna and Snisarenko, 2020);
- administrative/instructor issues: insufficient level of teaching staff proficiency in the didactic use of technologies (Thomas et al., 2017); excessive bureaucracy of e-learning as on-line teaching takes around twice as long to prepare and deliver as in-person teaching (Kebritchi, Lipschuetz and Santiague, 2017);
- development of skills: the lack of specific skills (academic and technical skills) in both students and instructors required for online learning (Contreras et al., 2021);
- stakeholders' perceptions of on-line teaching and ethical issues: learning effectiveness, learner's attitudes, teacher's attitudes, parents' attitudes, learner's motivation, (dis)satisfaction with the course design or class delivery, reduced class understanding and distraction; chances of easier cheating for students (Fatoni et al., 2020; Goodlad, Westengard and Hillstrom, 2018);
- classroom management: limited outreach and difficulties interacting with among students and teachers, the feeling of isolation and loneliness, the lack of timely feedback from the instructor, low level of student participation (Prokopenko and Berezhna, 2020; Contreras et al., 2021);
- strategies to cope with the challenges in distance education during COVID-19 epidemic period (Sari and Nayır, 2020).

Method. This paper presents an analysis and synthesis of the research conducted in the changed environments for teachers and learners who had to move from predominately face–to–face mode to online one. This mini research is limited to the issues and strategies produced by scholars to solve the problems of micro–level of DE, namely, e-learning.

Conceptual framework

There are some concepts in literature used interchangeably that refer to education at distance, such as distance learning, distributed learning, blended learning, online learning, remote learning and others, but the concepts are fundamentally different in definition. Bawaneh (2020) stresses that scholars use different terms to define different tools, methods or systems of distance education. E-learning is intertwined with the concept of distance/remote education and is an electronic form of well–planned educational process since it uses electronic media, such as laptops, smartphone, tablets, computers, electronic educational platforms (e.g., Learning Management Systems). It transforms printed materials into electronic materials (Heeks, 2020) and adapts traditional forms of in-personal teaching to on-line teaching and virtual classrooms via WebEx, Zoom, Google Classroom, Skype. E–learning has specific tools, modes, teaching methods to deliver the content as well as assesses students' learning outcomes. This form of distance/remote education is learner–oriented since it is based on the principles of personalized learning (Saba and Shearer, 2018). E–learning facilitates communication and interaction between students and teachers, between students themselves without face–to–face contact between participants of interaction (Moore, 1989) as well as provides online and offline access to education, thus, it supports student's autonomy and self–learning.

This study refers to e-learning as an electronic form of distance education aimed at providing access to education through information and communication technologies (ICT) and via the Internet.

Interactions are critical to active learning and are identified as an important factor affecting educational success in e-learning. The research made by Gros, Garcia and Escofet (2012) points out that in-personal teaching should use the potential of e-learning and teaching strategies have to value the interaction with the teacher and the students. Zimmerman (2012) investigated the interrelationship between students' interactions and the success of learning outcomes (Zimmerman, 2012, p.167). Bond (2021), in her systematic review of 89 studies on teaching and learning during the COVID-19 pandemic, revealed that among the recommendations for teachers on how to improve e-learning for students, the recommendation to design activities with interaction ranks number 1.

Educational interaction in the e-learning format is a multidimensional phenomenon characterized by: modality (fully online or blended); pacing (class–paced or self–paced); interaction agents' ratio; communication mode (asynchronous mode – synchronous mode); interaction management (pedagogical approach to course material delivery, teacher – student functions in interactions, the function of assessments; feedback between interaction agents) (Means et al., 2014).

The types of interaction in e-learning are extended with the advancements of technology and application of pedagogical theories/ concepts:

- learner to content interaction and its subdimension–learner-self interaction, learner to instructor interaction, or learner to learner interaction based on cognitive behavioural pedagogy (Moore, 1989; Soo and Bonk, 1998);
- learner to interface interaction and its subdimensions: instructor to content interaction, content to content interaction, instructor to instructor interaction (Hillman, Willis and Gunawardena, 1994; Anderson and Garrison, 1998);
- group-content interaction, group-group interaction, learner-group interaction, and instructor-group interaction based on social constructivist pedagogy (Dron, 2007);
- hierarchical model for instructional interaction based on connectivism (Wang, Chen and Anderson, 2014).

Results

Among the factors needed to be considered before implementing e-learning in the HEI educational process is the on-line student profile as e-learning is based on the principle of learner–centeredness that imply individualization and personalization of e-learning. In teaching practice, it means to consider the average student profile as well as learners' individual characteristics and personality and apply technologies to meet learner's requirements while designing interactive e-learning environments. The analysis of the literature demonstrates the lack of sources providing the average student profile. One recent typology of the changing on-line student profile emerging from social factors was proposed by Sánchez-Gelabert, Valente and Duart (2020). The scholars classified on-line learners as employed students, young unemployed students, international postgraduate students, multiple responsibilities (Sánchez-Gelabert, Valente and Duart, 2020). A core student profile is presented by employed students and multiple responsibilities, i.e., employed students with low or uncompleted educational levels with both work and family responsibilities. Nevertheless, scholars investigated the student profile at a university that gives all its courses online, namely the Universitat Oberta de Catalunya. Thus, the university delivers fully-fledged on-line courses and the student profile cannot be applied to students who are taught through crisis e-learning as they have little choice.

Scherer, Rohatgi and Hatlevik (2017) classified the student profiles on the use of ICT for "school–related purposes" versus "leisure purposes". The study provides the evidence that students' use of ICT varies across contexts and students do not equally use the available ICT (Scherer, Rohatgi and Hatlevik, 2017). Much of the research on the student's profile has been conducted prior to the pandemic when e-learning was not coined as "emergency (crisis) e-learning, hence, it was intrinsically different. Thus, the findings of scholars should be applied with cautiousness.

The abovementioned types of interaction may be used in an adaptive interactive educational environment that can be adjusted to meet each learner's needs via interaction (Cetinkaya and Keser, 2018). According to Oliver, the critical design elements for any educational environment are course content, learner support,

learning activities (Oliver, 1999). The design of the course content can be rather time–consuming for the instructor if he/she tries to replicate the traditional in-personal classes due to the increased preparation of instruction provided verbally in face-to-face classes as well as additional time required to prepare the course materials and write study guides. However, the e-learning media provides learners with access to diversity of sources with which students can work at their own pace.

Learning activities in e-learning environments are learner–centered and typically collaborative ones that determine learning outcomes. Among the most frequently pedagogical theories/ concepts applied in e-learning are Community of Inquiry, Collaborative learning, Constructivism, Connectivism (Bozkurt et al., 2015). Equipped with these theories, teachers promote learning outcomes through fostering dialogue and a community of inquiry or through designing collaborative learning activities (Arinto, 2013).

Learner's support depends on the role of the instructor. In learner–centered educational environments, the instructor plays the role of a moderator, a coach, a facilitator adopting participatory pedagogies (students as co-creators) or teaching with others ("teaching with networks") (Arinto, 2013). Thus, this form of learner's assistance is called scaffolding that provides the purposeful design of activities involving peer cooperation and collaboration (Oliver, 1999).

Discussions

Human to human type of interaction (e.g., learner to instructor interaction, or learner to learner interaction, group-group interaction, learner-group interaction, etc.) is by its nature the communication. The communication in e-learning format is influenced by external conditions (availability and access to various e-learning materials, access to the Internet, the distance between participants, etc.), social norms (different from traditional education, design and delivery of practical classes, seminars, etc., assessment, and feedback communication, etc.), communication scripts (communicative situations of educational interaction mediated via a computer and means of information and communication technologies; therefore, educational interactions are significantly enriched with the didactic capabilities of e-learning).

According to the principle of dichotomy and the criterion of «degree of activity», human to human type of interaction can be of mono-agent (linear) models of interaction and poly-agent (cyclic) personality-oriented model of interaction. Linear models of interaction commonly lead to socio-psychological alienation of its participants, as they are destructive and conflicting ones by nature. The agent-agent model of interaction is a constructive and interactive one characterized by each participant's purposeful influence on the other participant to satisfy his/her interests.

The student-teacher interaction should be focused on the dialogue between students and the teacher. Cetinkaya and Keser (2018) recommend to provide learners with adaptive guidance/coaching. The adaptive guidance is defined by Yelnikova (2005) as the process of mutual influence, which causes the mutual adaptation of the behavior of the actors of activity on a dia- (poly-) logical basis, which is provided by joint realistic goal setting with further combining efforts and self-direction to achieve it. It should be

kept in mind that the task of a teacher in e-learning is to design a communicative field, which involves the design of learning activities and support, the design of educational influences and educational interaction organization mediated by a computer. The teacher should take into consideration the requirements to the dialogue, in particular the basic psychological requirements to maintain the appropriate level of students' motivation, taking into account the age and students' individual characteristics, as well as motives for using the Internet, the role of which increased significantly due to the Covid-19 pandemic, when HEIs were forced to switch to the e-learning format.

Conclusions

We can conclude that scholars and stakeholders of education experience challenges due to online mode at all levels (macro-level, meso–level, micro–level). The analysis of the literature at micro–level of education reveals the deficit of sources providing the average online student profile. This fact, in some way, may hinder to design teacher–learner interaction based on the learner–centeredness principle. It can lead to poor classroom management, lower learners' performance and less participation than in face-to-face modality.

The current research reveals that one of the strategies to cope with inefficient on–line classroom management is the utility of using the principles of personalization of education to design tasks and resources supporting learning in online settings. The basic principles of personalization to design an educational interaction are the following ones, such as, the principle of dialogization, i.e. equality of interaction agents, their readiness for cooperation and co-creation, etc.; the principle of educational content problematization that facilitates student's problem–solving and decision–making skills as well as self–development of personal qualities; the principle of learner-centeredness stipulating personalization and individualization of learning. Individualization of education provides a flexible learning schedule due to its interactive nature supported with the use of information and communication technologies allowing the use of various technologies and teaching methods.

Personalization of education, in contrast to individualization, involves the creation of conditions for determining each student's own educational trajectory and is based on personality-oriented learning which changes the role of the teacher. The teacher is an assistant, facilitator of the student's personality development. Due to this factor, the nature of the educational situation management changes – there is a gradual transition from management through co-management to self-management, the switch from the authoritarian character of interaction to the democratic one. It changes the student's attitude to the acquisition of competencies from the reproductive acquisition of knowledge to a productive creative process initiated by the student in the process of joint activities and various forms of interaction. The recommendations derived from this research are in three levels: professors, the education system, and the government. Professors should consider their students' context and limitations to make adjustments to their programs to successfully orient education towards critical thinking.

References

Anderson T. and Garrison D.R. (1998). Learning in a networked world: New roles and responsibilities. In: C. Gibson, ed., *Distance learners in higher education*. Madison, WI.: Atwood Publishing, pp. 97–112.

Arinto P.B. (2013). A framework for developing competencies in open and distance e-learning. *The International Review of Research in Open and Distributed Learning*, 14(1), p. 167.

Bawaneh A.K. (2020). The satisfaction level of undergraduate science students towards using e-learning and virtual classes in exceptional condition Covid-19 crisis. *Turkish Online Journal of Distance Education*, 22(1), pp. 52–65.

Bloland H.G. (2005). Whatever Happened to Postmodernism in Higher Education?: No Requiem in the New Millennium. *The Journal of Higher Education*, 76(2), pp. 121–150.

Bond M. (2021). Schools and emergency remote education during the COVID-19 pandemic: A living rapid systematic review. *Asian Journal of Distance Education*, 15(20), pp. 191–247.

Bozkurt A., Akgun-Ozbek E., Yilmazel S., Erdogdu E., Ucar H., Guler E., Sezgin S., Karadeniz A., Sen-Ersoy N., Goksel-Canbek N., Dincer G.D., Ari S. and Aydin C.H. (2015). Trends in distance education research: A content analysis of journals 2009–2013. *The International Review of Research in Open and Distributed Learning*, [online] 16(1). Available at: https://www.erudit.org/en/journals/irrodl/2015-v16-n1-irrodl04978/1065940ar/.

Cetinkaya L. and Keser H. (2018). Adaptation of interaction in web environments with educational content. *World Journal on Educational Technology: Current Issues*, 10(3), pp. 142–152.

Contreras C.P., Picazo D., Cordero-Hidalgo A. and Chaparro-Medina P.M. (2021). Challenges of Virtual Education during the COVID-19 Pandemic: Experiences of Mexican University Professors and Students. *International Journal of Learning, Teaching and Educational Research*, 20(3), pp. 188–204.

Dron J. (2007). *Control and constraint in e-learning: choosing when to choose*. Hershey, PA.: Information Science Pub.

Saba F. and Shearer R.L. (2018). *Transactional distance and adaptive learning: planning for the future of higher education*. New York, Ny: Routledge.

Fatoni, Arifiati N., Nurkhayati E., Fidziahe, Pamungkas G., Adha S., Irawanh, Purwanto A., Julyanto J. and Azizi E. (2020). University Students Online Learning System During Covid-19 Pandemic: Advantages, Constraints and Solutions. *Sys Rev Pharm*, 11(7), pp. 570–576.

Goodlad K., Westengard L. and Hillstrom J. (2018). Comparing Faculty and Student Perception of Academic Performance, Classroom Behavior, and Social Interactions in Learning Communities. *College Teaching*, 66(3), pp. 130–139.

Gros B., Garcia I. and Escofet A. (2012). Beyond the net generation debate: A comparison between digital learners in face-to-face and virtual universities. *The International Review of Research in Open and Distributed Learning*, 13(4), p. 190.

Heeks R. (2020). ICT4D 3.0? Part 1—The components of an emerging "digital-for-development" paradigm. *The Electronic Journal of Information Systems in Developing Countries*, 86(3).

Hillman D.C.A., Willis D.J. and Gunawardena C.N. (1994). Learner-interface interaction in distance education: An extension of contemporary models and strategies for practitioners. *American Journal of Distance Education*, 8(2), pp. 30–42.

Hodges C., Moore S., Lockee B., Trust T. and Bond A. (2020). *The Difference Between Emergency Remote Teaching and Online Learning*. [online] er.educause.edu. Available at: https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning.

Kebritchi M., Lipschuetz A. and Santiague L. (2017). Issues and Challenges for Teaching Successful Online Courses in Higher Education. *Journal of Educational Technology Systems*, [online] 46(1), pp.4–29. Available at: https://journals.sagepub.com/doi/10.1177/0047239516661713 [Accessed 7 Jan. 2020].

Moore M.G. (1989). Editorial: Three types of interaction. *American Journal of Distance Education*, 3(2), pp. 1–7.

Nenko Y., Kybalna N. and Snisarenko Y. (2020). The COVID-19 Distance Learning: Insight from Ukrainian students. *Revista Brasileira de Educação do Campo*, 5, pp. 1–19.

Oliver R. (1999). Exploring strategies for online teaching and learning. *Distance Education*, 20(2), pp. 240–254.

Prokopenko I. and Berezhna S. (2020). Higher Education Institutions in Ukraine during the Coronavirus, or COVID-19, Outbreak: New Challenges vs. New Opportunities. *Revista Romaneasca pentru Educatie Multidimensionala*, 12(1Sup2), pp. 130–135.

Sánchez-Gelabert A., Valente R. and Duart J.M. (2020). Profiles of Online Students and the Impact of Their University Experience. *The International Review of Research in Open and Distributed Learning*, 21(3).

Sari T. and Nayır F. (2020). Challenges in Distance Education During the (Covid- 19) Pandemic Period. *Retos de la Educación a Distancia Durante el Período Pandémico (Covid-19).*, [online] 9(3), pp. 328–360.

Scherer R., Rohatgi A. and Hatlevik O.E. (2017). Students' profiles of ICT use: Identification, determinants, and relations to achievement in a computer and information literacy test. *Computers in Human Behavior*, [online] 70, pp. 486–499. Available at: https://www.sciencedirect.com/science/article/pii/S0747563217300468 [Accessed 4 Aug. 2019].

Soo K.-S. and Bonk C.J. (1998). *Interaction: What Does It Mean in Online Distance Education?* ED Media & ED-Telecom. Frieburg, Germany.

Thomas O., Adeyanju J., Popoola B.G. and Odewale T. (2017). Competency Training Needs of Lecturers for Effective e-Learning Instructional Delivery in Teacher Education Programmes. In: *Thomas, Olusola; Adeyanju, Jacob; Popoola, Bolaji Gabriel; Odewale, Temitayo. International Conference on e-Learning; Kidmore End : 213–220. Kidmore End: Academic Conferences International Limited. (Jun 2017)*. International Conference on e-Learning. Kidmore End:, pp. 213–220.

Tomczyk Ł. And Walker C. (2021). The emergency (crisis) e-learning as a challenge for teachers in Poland. *Education and Information Technologies*.

Yelnykova H. V. Naukovi osnovy adaptyvnoho upravlinnia zakladamy ta ustanovamy zahalnoi serednoi osvity [Scientific bases of adaptive management of establishments and establishments of general secondary education], K., 2005. 453 p. [in Ukrainian]

Wang Z., Chen L. and Anderson T. (2014). A framework for interaction and cognitive engagement in connectivist learning contexts. *The International Review of Research in Open and Distributed Learning*, 15(2).

Zawacki-Richter O., Baecker E.M. and Vogt S. (2009). Review of distance education research (2000 to 2008): Analysis of research areas, methods, and authorship patterns. *The International Review of Research in Open and Distributed Learning*, 10(6), p. 21.

Zimmerman T.D. (2012). Exploring learner to content interaction as a success factor in online courses. *The International Review of Research in Open and Distributed Learning*, 13(4), p. 152.

E-learning in HEI education process: challenges and opportunities

Abstract

The article analyzes the current situation at the Higher Educational Institutions (HEIs) forced to complete their transition to the distance/remote education during the COVID-19 pandemic. The implementation of e-learning technologies in HEIs educational process offers a range of opportunities for all students through better accessibility, increased interaction between teachers and students and between students and their peers, greater flexibility, cost–effectiveness. However, the transition to an emergency (crisis) e-learning induced by the coronavirus epidemic presents new challenges to stakeholders of higher education (professors, students, administrative staff, parents, educational authorities). The emergency (crisis) e-learning requires enhancing the level of teachers' digital proficiency, reengineering of the course design, delivery and students' assessment, rethinking the roles of both teachers and students involved in educational process, facilitating teacher to student(s) and student to student interactions, developing recommendation for improving quality of education. This paper presents an analysis of the challenges faced by teachers and students during months-long quarantine and the analysis of new support strategies aimed at adapting student-centered approaches. The study examines teaching practices and recommendations to improve the level of students' academic achievements through encouraging teacher to student(s) and student to student interactions in e-learning environment. The authors provide some practical tips on adapting interactions to the learner's needs.

Keywords: COVID-19, emergency (crisis) e-learning, student-centered approaches, teacher to student(s) interaction, student to student(s) interaction

Prof. Tetyana Borova
Department of Pedagogy, Foreign Philology and Translation, Simon Kuznets Kharkiv National University of Economics (Kharkiv, Ukraine)
email: Tetyana.Borova@ hneu.net
ORCID: 0000-0003-1765-4425

PhD, Assoc. Prof. Viktoriia Petrenko
Department of Pedagogy, Foreign Philology and Translation, Simon Kuznets Kharkiv National University of Economics (Kharkiv, Ukraine)
email: viktoriia.petrenko@gmail.com
ORCID: 0000-0001-7209-5107