The impact of E-learning on higher education perception, skills, critical thinking and satisfaction

M L H Khan1,* and A Setiawan2

1Program Studi Pendidikan Teknologi dan Kejuruan, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudi 229 Bandung, Indonesia
2Mechanical Engineering, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudi 229 Bandung, Indonesia

*Lhkhan.dhaka@gmail.com

Abstract. E-learning was initially implied as an emotionally supportive network for separation learning and this is the reason e-learning is regularly called separate training, despite the fact that e-learning is a smaller idea. E-learning is utilized to convey preparing, training and cooperation utilizing different electronic media in any case, overwhelmingly, the Internet, whose apparatuses have comprised the principle driver of e-learning and e-Learning has impact on students’ perception, critical thinking and others factors. The review is intended to provide a summary and a critique of various e-learning research topics and methods. The 3-step review process was composed of articles searching and retrieval, filtering and sorting, and final inclusion. It was found that e-learning improved student perceptions, communication, quality of education, critical thinking, self-learning and the result also shows that the impact of teacher’s responsibility and students’ satisfaction in higher education.

1. Introduction

The wide acceptance and availability of the Internet means that e-learning eliminates time, distance and socio-economic status barriers and at the same time allows people to take more responsibility for their lifelong learning [1]. Students can take advantage of a wide range of experts and resources that may not be available locally. E-learning aspects were explored in studies comparing e-learning with traditional teacher-led approaches; including usefulness, efficiency, cost-effectiveness and satisfaction of learners, and learners gain more knowledge, skills and attitudes than traditional methods [2]. E-learning makes it easy to make new friends with people who are physically distant but can be close in terms of interests, problems and experiences. It promotes the development of social contacts for people who are tacit, shy or closed [3]. Among other benefits of e-learning, high efficiency in the acquisition of knowledge and the attractiveness of the technical environment, especially for young people, are also mentioned. The advantages shown are flexibility, accessibility, satisfaction and cost efficiency [4].

E-learning, on the other hand, has some drawbacks. The opacity of the designs also forces the need to learn new technical problems and to run a learning platform and a program for older participants in particular [5]. There is also a lack of direct contact with the group and the teacher, the "face to face" relationship [6]. This is especially important from the point of view of students of social sciences, where it is important not only to acquire knowledge but also social skills. The big disadvantage is that the group has no social and professional experience. This is the experience gained in workshops, workshops...
and seminars in particular. Students should not only read the materials, listen to the lecture, but also participate in the observation and experience certain educational or teaching scenarios and acquire skills in action [7].

2. Another section
This systematic review aims to investigate the impact of e-learning on the knowledge, skills and satisfaction of university and higher education students in comparison with traditional methods of education and also intend to help educators to understand why the adoption of e-learning in higher education institution. The review is also intended to provide a summary and a critique of various e-learning research topics and methods. The data could be used to identify important issues and questions in the literature and help to shape future research trajectories of the e-learning.

3. Method

3.1. Data sources and searches papers
Research articles from ScienceDirect, IEEE, Tailor & Francis, and Sage computerized databases have been searched and downloaded from October to November 2018. The following keywords were used to obtain research-based items from the above-mentioned databases: a) E-learning in higher education b) Online learning, and c.) Web-based learning. Articles in English have been considered. The references mentioned in the selected articles were also taken into account and downloaded. The snowballing search technique was used to collect items. As at 22 December 2018, the cumulative number of publications in different electronic databases was as follows: Science direct (n=79863), Taylor and Francis (n=434150), IEEE (n=869), and Sage (n=216480).

3.2. Process for filtering and sorting
The total number of articles retrieved and reviewed based on titles, abstracts, study design, and basic findings were 100. Articles extracts were tabulated under the following subheadings; Author and year of publication, participants, context, study design, and basic findings. Articles related which are not related to higher educations were deliberately excluded. The exclusion list consisted of 40 items out of 100 items obtained.

4. Results
Most e-learning articles relate to the following variables; communication, student’s perception, quality education, critical thinking, self-learning, teacher’s responsibility, and satisfaction.

4.1. Communication
In a study conducted by Allworth [8], communication between students can play an important role in education, especially at the postgraduate level. Students appreciate the possibility of participating in e-learning and studying in this less traditional way [9]. In a qualitative method in which 408 students were enrolled in 14 class sections of 6 courses at a university of four academic years, students take the initiative to contact the teacher, but if the students do not play an active role, they will not communicate with the teacher adequately. In this way, an effective and efficient improvement plan was established to improve the efficient use of resources in e-learning and to achieve an adequate level of quality [10]. Students’ overall assessments of the course range from good to excellent and the content of the course was also positively evaluated by all students. This can be attributed to the nature of distance education programmes, as students have the unique opportunity to meet the instructor and their colleagues during synchronous courses [11].

4.2. Student’s perception
Students had a relatively positive perception of the e-learning course and about 68 percent of students agreed that the course was fun [12]. The students benefited from the integration of e-learning and the
most important thing was that the students’ perception of homework tasks had been changed. It was also intuitive and easy to use [13]. They represented a career interest in various fields and backgrounds in science, from natural science and engineering to social science. Almost all students have been familiar with the program by visiting the university website and searching [14].

The e-learning platform was a real challenge that changed the perception of homework and importance of students. It is also a good solution for class management and prevents possible errors in the identification of homework senders [15]. It is clearly indicated that e-learning courses can be conducted in an interesting and understandable manner and that the level of knowledge assimilation can be regularly checked by short online tests, giving participants the additional motivation to learn [16].

A study from Africa provides an understanding of social tensions and contradictions in the adoption of e-learning in Africa. These paradoxes should therefore lead to a call for action that would bring about the adoption of e-learning and changes associated with adoption in order to achieve its benefits in Africa [17]. A series of complementary analyzes in which we used the likes of individual participants instead of the mean dyad scores also helped us to understand the effect of this gender [18]. Another interesting result of other research is that the information is preferred to be supported by video and image instead of audio. There were no significant differences between the sexes in terms of the perception of e-learning benefits or in terms of the knowledge gained through the e-learning programme [19].

4.3. Quality education

Contemporary education, based on distant IT technologies, goes beyond the national borders and becomes an open space, giving everyone around the world the opportunity to obtain high-quality education, regardless of location and accommodation [20]. It is characterized by an increasing availability and quality of virtual learning environments and social pressure to integrate new technologies, but the introduction of e-learning platforms in the world of higher education has implications that go beyond technological aspects and change the teaching and learning process [21].

The vast majority of teachers (73.6 percent) want to take distance education [22]. Distance education improves the quality of education and it has been demonstrated that distance learning can offer all types of courses except professional and practical courses. The overall ease of use for the adoption of e-learning as a new teaching and learning technology for both faculty and students and departments and university resources more closely aligned. In terms of online learning needs, supporting technology was the top priority overall [23].

Results from a study in Turkey show that distance education can provide an important data source to monitor the success and equality of distance learning in infant education [24]. It enhances the quality of practical training and makes the course better understood. A lecture can undoubtedly teach more students in a wider geographical area by responding to e-learning technology [25].

In another study, the Moodle platform, which has become more widely used in Romania, is used to support educators who aim to improve the quality of online courses, but also to support students in order to make their learning easier. However, not all facilities impose the use of the virtual environment in the learning process, although all university students have accounts and are enrolled in semester courses [26].

4.4. Critical thinking

A study by Al-Fadhli [12] explores whether there is a link between the students computer competency and his/her attitude toward e-learning. The results of the attitudes towards e-learning in improving critical thinking skills show that 77.8 percent of participants responded with ‘acceptance’ and ‘strongly agree’ that the course helped them improve their critical thinking skills. E-learning system for virtual learning that develops creative thinking for higher education learners. Learning in a virtual learning environment with an e-learning system to promote creative thinking for students by encouraging communication between students and instructors, students and students [27].
4.5. Self-learning
A survey of 504 members (194 males, 310 females) from the University of Porto was conducted between mid-December 2012 and early January 2013. The result shows that a large majority of participants (92.1 percent) responded positively if they had ever looked for online educational resources in a self-teaching environment. Only a minority of participants claimed distance learning experience [28].

4.6. Teacher’s responsibility
In a study by Semradova I and Hubackova [29] shows that the future teachers of students express their opinion that the teacher responsible for implementing ICT in the education process is the same or higher if the teacher is also the author of distance education courses. Teachers in the survey assume that responsibility in traditional face-to-face education is generally higher than in distance learning. Another study shows that ICT is not widely used at present. It was found to be very low. However, teachers neither develop e-content nor upload course plan on websites [30].

4.7. Student’s satisfaction
In a questionnaire survey [31], students are interested in this new technology. This also demonstrates that the concept of e-learning can be more easily accepted if it can provide at least the same learning experience based on the current style of education and an interactive learning environment for users. An interview survey [32] provides new insights into how institutions of higher education can promote continuity satisfaction to ensure the continuation of e-learning. The results for the instructors show that the key factors for their continued satisfaction with e-learning are the quality of information, task technology, system quality, confirmation, usefulness, achievement value and utility value. The trust factor in learning ETs was high compared to communication based on Skype only. The students keep the lecture on an equal footing with both systems. The students found ETS welcome and comfortable and showed their readiness to purchase this product in informal interviews 2015.

5. Limitations and Implications
A review of users’ satisfaction with e-learning may offer new research opportunities for users to adopt learning technology. It also brings new understanding in the field of teaching technology, focusing on users’ behavioral intentions in e-learning tool. The sample used was limited to higher education and the results of this study should therefore be cautiously generalized.

In addition, we identified some factors related to the satisfaction of users with e-learning continuity based on our systematic literature review in this study. However, our process of filtering and selection of articles was limited to certain criteria based on recommendations from previous studies, which included few articles published in peer-reviewed journals.

6. Conclusion
In this systematic review it is clearly indicate that the e-learning courses can be conducted in an interesting and understandable way and that the level of assimilation of knowledge can be regularly checked by short online tests which are the additional motivation to participants to learn. The use of e-learning in education improves the quality of practical education and better understands the course. Unquestionably, a lecture can teach more students in a broader geographical area by responding to e-learning technology. In general, this review offers important information to increase the knowledge base on the effectiveness of different educational methods. In the future, there is still a need to develop and evaluate methods for education among higher education students. It is important that these studies are conducted to show the effectiveness and they should also focus on the variety of different levels of outcomes.
References

[1] Sannino A and Engeström Y 2017 Studies of expansive learning: Foundations, findings and future challenges Introduction to Vygotsky (Routledge) pp 100–46

[2] Sharpe R, Benfield G, Roberts G and Francis R 2006 The undergraduate experience of blended e-learning: a review of UK literature and practice High. Educ. Acad. 1–103

[3] Truskolaska J, Luka M, Toruj N, Wrona K and Smagowska P 2015 E-Learning at the Polish University in the Opinion of Students Procedia-Social Behav. Sci. 174 3494–9

[4] DeLone W H and McLean E R 1992 Information systems success: The quest for the dependent variable Inf. Syst. Res. 3 60–95

[5] Helmsing B 2001 Externalities, learning and governance: new perspectives on local economic development Dev. Change 32 277–308

[6] Sife A, Lwoga E and Sanga C 2007 New technologies for teaching and learning: Challenges for higher learning institutions in developing countries Int. J. Educ. Dev. using ICT 3 57–67

[7] Grow G O 1991 Teaching learners to be self-directed Adult Educ. Q. 41 125–49

[8] Allworth M B 2014 Postgraduate distance education in sheep health veterinary education Small Rumin. Res. 118 97–9

[9] Csikosova A, Teplicka K and Senova A 2012 Communication and Humanization of University Education Through E-Learning Procedia - Soc. Behav. Sci. 46 2978–82

[10] Martinez-Caro E, Cegarra-Navarro J G and Cepeda-Carrión G 2015 An application of the performance-evaluation model for e-learning quality in higher education Total Qual. Manag. Bus. Excell. 26 632–47

[11] Ekmekçi E 2015 Distance-education in Foreign Language Teaching: Evaluations from the Perspectives of Freshman Students Procedia - Soc. Behav. Sci. 176 390–7

[12] Al-Fadhli S 2008 Students’ Perceptions of E-Learning in Arab Society: Kuwait University as a Case Study E-Learning 5 418–28

[13] Benta D, Bologa G, Dzitac S and Dzitac I 2015 University level learning and teaching via e-learning platforms Procedia Comput. Sci. 55 1366–73

[14] Azeiteiro U M, Bacelar-Nicolau P, Caetano F J P and Caiero S 2015 Education for sustainable development through e-learning in higher education: Experiences from Portugal J. Clean. Prod. 106 308–19

[15] Benta D, Bologa G and Dzitac I 2014 E-learning platforms in higher education. Case study Procedia Comput. Sci. 31 1170–6

[16] Truskolaska J, Luka M, Toruj N, Wrona K and Smagowska P 2015 E-learning at the Polish University in the Opinion of Students Procedia - Soc. Behav. Sci. 174 3494–9

[17] Njenga J K 2018 Sociocultural paradoxes and issues in e-learning use in higher education Africa Glob. Soc. Educ. 16 120–33

[18] Stürmer S, Ihme T A, Fisseler B, Sonnenberg K and Barbarino M L 2018 Promises of structured relationship building for higher distance education: Evaluating the effects of a virtual fast-friendship procedure Comput. Educ. 124 51–61

[19] Pamfilie R, Onete B, Maiorescu I and Plesa D 2012 E-Learning as an Alternative Solution for Sustainable Lifelong Education Procedia - Soc. Behav. Sci. 46 4026–30

[20] Nurmukhametov N, Temirova A and Bekzhanova T 2015 The Problems of Development of Distance Education in Kazakhstan Procedia - Soc. Behav. Sci. 182 15–9

[21] Torres A L M O C 2011 Understanding and intervening in E-learning in higher education institution Procedia - Soc. Behav. Sci. 15 756–60

[22] Kübra Çelen F, Çelik A and Seferoğlu S S 2013 Analysis of Teachers’ Approaches to Distance Education Procedia - Social Behav. Sci. 83 388–92

[23] Chow A S and Croxton R A 2017 Designing a Responsive e-Learning Infrastructure: Systemic Change in Higher Education Am. J. Distance Educ. 31 20–42

[24] Kantek F 2014 Distance Education in Nursing in Turkey Procedia - Soc. Behav. Sci. 116 639–43

[25] Yanuschik O V., Pakhomova E G and Batbold K 2015 E-learning as a Way to Improve the Quality
of Educational for International Students *Procedia - Soc. Behav. Sci.* **215** 147–55

[26] Oproiu G C 2015 A Study about Using E-learning Platform (Moodle) in University Teaching Process *Procedia - Soc. Behav. Sci.* **180** 426–32

[27] Songkram N 2015 E-learning System in Virtual Learning Environment to Develop Creative Thinking for Learners in Higher Education *Procedia - Soc. Behav. Sci.* **174** 674–9

[28] Morais E, Morais C and Paiva J 2014 Myths and realities of e-learning: Exploratory survey of higher education students *E-Learning Digit. Media* **11** 300–13

[29] Semradova I and Hubackova S 2016 Teacher Responsibility in Distance Education *Procedia - Soc. Behav. Sci.* **217** 544–50

[30] Banday M T, Ahmed M and Jan T R 2014 Applications of e-Learning in Engineering Education: A Case Study *Procedia - Soc. Behav. Sci.* **123** 406–13

[31] Zakariah Z, Alias N, Aziz M N A and Ismail N Z 2012 E-Learning Awareness in a Higher Learning Institution in Malaysia *Procedia - Soc. Behav. Sci.* **67** 621–5

[32] Al-Samarraie H, Teng B K, Alzahrani A I and Alalwan N 2017 E-learning continuance satisfaction in higher education: a unified perspective from instructors and students *Stud. High. Educ.* **0** 1–17