E-learning success determinants in higher education: A systematic literature review from users’ perspective

A F Rizana¹*, U Y K S Hediyanto², F Ramadhan³ and A Kurniawati¹

¹ Department of Industrial Engineering, Telkom University, Bandung, Indonesia
² Department of Information System, Telkom University, Bandung, Indonesia
³ Department of Industrial Engineering, Institut Teknologi Nasional, Bandung, Indonesia

*afrinfauzya@telkomuniversity.ac.id

Abstract. The implementation of e-learning become more and more popular among higher education institution. However, the costly implementation of e-learning not a guarantee that it will be successfully adopted. There are reports where the adoption rate of e-learning users is often low, resulting the expected benefits failed to be achieved. In order to solve this issue, the important factors that influence users’ adoption and usage rate need to be identified. Therefore, this study aims to identify the critical factors of e-learning success in higher education. A systematic literature review protocols was employed in this study to identify the success factor of e-learning from previous literature. The review process is conducted towards articles published in science direct and emerald insight from the past 10 years. There are total 20 articles selected as primary articles for further review. According to the articles reviewed in this study, the success of e-learning implementation is reflected on three variables i.e. users’ satisfaction, actual usage, and continuance usage. Moreover, there are six dimension that is critical towards e-learning success i.e. students’ characteristics, instructors’ characteristics, users’ extrinsic motivation, infrastructure and system quality, course and content quality, and organizational support.

1. Introduction
Rapid growth of internet and information technology has created many changes and new opportunities in human life, including education aspect [1,2]. The availability and accessibility to various electronic device, internet, and application e.g. google hangout, skype, meeting words, etc. have made it possible to conduct and join virtual classroom where teacher and learner can stay anywhere in the world as long as there is access to computer and internet [3]. Thus, e-learning now become a trend in education area. It is viewed from the fact that more than 1000 education institution around the world offer e-learning as one of learning facilities [1]. The implementation of e-learning is believed to bring benefits for both students and institutions. Several benefit of e-learning implementation for students including better and more flexible content delivery, increase content standardization, on-demand course material accessibility, increase interactivity and convenience [1,4,5]. Through e-learning, learning content can be delivered over long distance and students can access learning course anytime and anywhere [4,5]. There is no doubt that e-learning offers easier access of online tutorial, essays, or explanation on any topic [4]. Moreover, for institutions, e-learning can improve monitoring to students’ ability, enable consistent delivery of learning content, and reduce costs e.g. labor cost, travel cost, facilities cost, etc.
Due to many benefits offered by e-learning, many education institutions invest time, money, and manpower for content development activity, training, and purchasing hardware and software license to implement e-learning to support their learning activities [1,5].

However, the costly implementation of e-learning not a guarantee that such technology will be successfully adopted. There are reports where the adoption rate of e-learning by the users is often low [6,7]. That condition of course leads to high failure rates of e-learning project [6]. Thus, it is important to identify factors that become determinants of e-learning success from the perspective user to prevent low rate of adoption by user. Therefore, the objective of this study is to identify the determinants of e-learning implementation success in higher education environment. The determinants identify in this study then used in the development of e-learning success model in higher education. The result of this study is expected to help e-learning stakeholder in universities in developing strategies and policies that will lead to e-learning implementation success.

2. Method

This study attempts to identify the determinants of e-learning implementation in higher education. A systematic literature review protocol developed by Kitchenham were employed in this study to identify factors that play a role as determinants of e-learning success from previous study. Basically, a systematic literature review consists of three main steps i.e. articles identification and collection, articles selection based on criteria, and primary articles selection. The first step is articles identification and collection. This step aims to obtain initial search of primary articles. There are two electronic databases used in this study for article search i.e. science direct and emerald insight. Moreover, the search strategy in those two electronic databases was also generated. The search strategy used in this study is the screening of the article where the articles appear must contain specific words i.e. “e-learning”, “success”, and “factor” either in title, abstract, or keyword. Moreover, the articles to be reviewed should publish in the range year of 2009 to 2019. The second step is articles selection based on criteria. In this step, the potential articles obtain from previous step was reviewed towards specific criteria. There are several criteria used in this study i.e. (1) Article should be written using English language; (2) The factors used in the study should have empirically tested; and (3) The object in the article is higher education/university. The last step is primary article selection. In this step, all the articles that passed from previous step will be further reviewed to check its quality. The article that pass quality checking will be used as primary article for further analysis.

3. Results and discussion

The number of articles obtained in initial article collection from science direct and emerald insight were 43 and 2031 respectively. From 43 articles obtained from science direct, there are 14 articles that met the criteria generated in this study. Thus, the remaining 29 articles were excluded in this study. Moreover, from 2028 articles obtained from emerald insight, there were 51 articles that met the criteria, while the remaining 1977 articles were excluded. Finally, after quality checked was performed, there are 20 articles used as primary study.

3.1. E-learning success

According to literature review, this study found that there are three dimensions that is often used as the dimension of e-learning success i.e. user satisfaction [8], e-learning usage, and e-learning continuance usage. Continuance intention refers to the extent of users’ willingness to use system in the future and also recommend others to use it [9,10]. Another success dimension of e-learning according to previous study is actual usage. Actual usage defined as the frequency of the students using e-learning. Previous studies have found that actual usage performed by the users will influence continuance usage intention of e-learning system [11]. The last success dimension obtained from literature review is user satisfaction. User satisfaction defined as the degree where e-learning users feel satisfy with their overall use of the course content through e-learning [8]. In this study, user satisfaction indicates how satisfied the students’ using e-learning system. Prior studies have found that users’ satisfaction is important in determining e-
learning success [9,12,13]. It is because users’ continuance usage intention of e-learning system is influenced by their satisfaction towards the system [14,15]. Therefore, the relationship between those three success dimensions is presented in figure 1.

![Figure 1. e-learning success dimension.](image1)

3.2. E-learning success factors

According to literature review, there are several dimensions that influence e-learning success. The categorization of e-learning success factors into several dimensions might be different between one study and another study. In this study, e-learning success factors were categorized into six dimensions. The six dimensions of e-learning success factors include learners’ characteristics, instructors’ characteristics, extrinsic motivation, learning environment, instructional design, and support. The summary of the dimension is presented in figure 2.

![Figure 2. e-learning success factors.](image2)

3.3. Learners’ characteristic

Learners’ characteristic is defined as characteristic possess by student that play critical role to the success of e-learning success [16]. There are several factors that is used in this study to describe student’s characteristic in e-learning environment i.e. computer self-efficacy, attitude towards e-learning, and self-regulated learning. Based on literature review, all those factors that build learners’ characteristic would affect users’ decision on actual usage and continuance usage intention of e-learning system. Detail explanation of each factors is presented in table 1.

| Factors                  | Definition                                                                 | Reference     |
|--------------------------|---------------------------------------------------------------------------|---------------|
| Computer Self-Efficacy   | User’s perception on their ability in using computer and interact with internet to finish their task | [1, 17-20]    |
| Attitude towards e-learning | Good impression that arise from student toward their participation in learning using e-learning | [1, 19, 21]   |
| Self-regulated learning  | The ability of students to participate actively in learning process through e-learning to obtain knowledge | [8, 20]       |

![Table 1. Factors of learners’ characteristic.](table1)
3.4. Instructors’ characteristic
Besides students’ characteristic, instructors’ characteristic also important in promoting e-learning success. There are several factors that is used in this study to describe instructor’s characteristic in e-learning environment i.e. computer self-efficacy, attitude towards students, and self-regulated learning. Based on literature review, all those factors that build learners’ characteristic would affect users’ decision on actual usage and continuance usage intention of e-learning system. Detail explanation of each factors is presented in table 2.

3.5. Users’ motivation
Previous study found that intrinsic and extrinsic motivation have a significant effect to users’ behaviour in using e-learning [1]. Factors that are important in capturing learning motivation include perceived enjoyment, perceived usefulness, social influence, and social image [1]. The detail explanation of the factors construct motivation dimension is presented in table 3.

3.6. Infrastructure and system quality
Infrastructure and system quality refer to the overall quality from technical infrastructure, hardware and software of e-learning system [8]. There are two factors included in this dimension i.e. facilitating condition and e-learning system quality. Facilitating condition refers to the degree where users believe that the technical infrastructure exists to support the use of e-learning system [11,22,23], including the availability of high-speed internet access, system availability, and network reliability. E-learning system quality has a strong effect on users’ satisfaction. E-learning system quality is often measured by system’s ease of use, interface, functionality, availability, and response time [8].

3.7. Course content quality
Course content quality refers to the degree of course management in e-learning system contains the content that is valuable to the students [8]. Course content quality dimension consists of three factors i.e. content quality, content relevance, and content flexibility. The detailed explanation of each factors can be seen in table 5.

| Table 2. Factors of instructors’ characteristic. |
|-----------------------------------------------|
| Factors                        | Definition                                                                 | Reference       |
| Computer Self-Efficacy          | Students’ belief towards instructors’ ability in using computer and interact with internet to finish their task | [1, 17-20]      |
| Attitude towards students      | The condition where students perceived that instructors provide time and method of contact with the students | [1, 19, 21]      |
| Timely response                | The condition where students perceived that instructor response quickly to their problem | [1]              |

| Table 3. Factors of extrinsic motivation. |
|------------------------------------------|
| Factors                   | Definition                                                                 | Reference       |
| Perceived Usefulness        | The degree where users believe that the use of e-learning will increase their learning performance | [1, 11, 22]     |
| Social Image                | Users’ perception that the use of e-learning can enhance their social status | [17]             |
| Social influence            | The extent where people significant to the student want them or even press to continue use e-learning | [1][11]         |
| Perceived Enjoyment         | The judgement made by users related the extent of how enjoy they use e-learning system aside from any performance consequences caused by system usage | [17]             |
Table 4. Factors of infrastructure and system quality.

| Factor          | Definition                                                                 | Reference |
|-----------------|---------------------------------------------------------------------------|-----------|
| Facilitating    | The degree where users believe that the technical infrastructure exists    | [11, 16, 23] |
| Condition       | to support the use of e-learning system                                   |           |
| System quality  | All aspect in e-learning system that affect the way students interact      | [8]       |
|                 | and use the system                                                        |           |

Table 5. Factors of course content quality.

| Factor          | Definition                                                                 | Reference |
|-----------------|---------------------------------------------------------------------------|-----------|
| Content Quality | The degree where text, image, video, and animation meet the standard       | [1, 8, 21] |
| Content Relevance | The degree where the course, content, and information met what the learners wants | [1, 8, 21] |
| Course Flexibility | The degree where the course can be access anytime anywhere | [1, 8, 21] |

3.8. Perceived organizational support

Perceived organizational support refers to the users’ perception towards support that is provided by the institution to facilitate e-learning usage. According to prior studies, there are two factors include in this dimension i.e. training and technical support. Providing adequate support and training is important to the successful of e-learning implementation [9]. Institutions are required to perform training to ensure that users will have enough skill to operate e-learning systems. Moreover, technical support is also considered as a key factor that enhance users’ willingness to use the system. The existence of technical support is positively influence users’ satisfaction in using e-learning system [9]. Lack of technical support lead to frustration when users face problem in using e-learning system [9].

Table 6. Factors of organizational support.

| Factor       | Definition                                                                 | Reference |
|--------------|---------------------------------------------------------------------------|-----------|
| Training     | Activity that held formally by institution to make users obtain required skill to perform task in e-learning | [9]       |
| Technical Support | Support provided by the institution in the form of providing help desk and information technology centre to answer questions related e-learning usage | [9, 19]   |

4. Conclusion

This study aims to identify the factors that are critical for e-learning implementation success in higher education. According to systematic literature review, the success of e-learning implementation is reflected on users’ satisfaction, actual usage performed by the users, and continuance usage intention. There are total 17 factors that can promote e-learning success. Those 17 factors are categorized into six dimensions i.e. learners’ characteristic, instructors’ characteristic, extrinsic motivation, course content quality, infrastructure and system quality, and organizational support. In this study, all 17 factors were obtained from two electronic databases. To obtain more comprehensive result, another electronic database can be included in future study. Moreover, the effect of each factors to the success dimension should be tested using the empirical data so that the e-learning stakeholder can obtain insight of factors that have big effect towards e-learning success.

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