
The Impact of Adoption and Utilization Of E-Learning Technology by Employees on the E-Learning System on Organizational Learning: Mediating Role of Service Quality of the E-Learning System

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Abstract: The study is carried out on the issues related to adoption and utilization of e-learning technology by employees, e-learning system on organizational learning, and service quality of the e-learning system. The study has examined the direct impact of adoption and utilization of e-learning technology by employees on the e-learning system on organizational learning. Meanwhile, the study has also examined the mediating role of service quality of the e-learning system. A 5-point Likert scale was adopted for the survey questionnaire for all the items. Number 1 on the scale referred to strongly disagree, and number 5 referred to strongly agree. The response rate of the study is 58 percent. The data is collected from the undergraduate student at Pakistani public universities. The time frame of the study is between June 2020 to January 2021. The SEM-PLS is employed for the data analysis, which is one of the robust statistical tools for examining structural models. It has been revealed by this research that organizational learning is directly influenced by employee satisfaction for the adoption and use of e-learning technology. However, the service quality of e-learning does not have a direct influence on institutional learning. The relationship between organizational learning effectiveness and service quality of the e-learning system has been fully mediated by the employee satisfaction of using e-learning technology.

Keywords: education, e-learning, service quality, Pakistan

BACKGROUND

With continuous economic changes across the world, intense pressure is faced by universities to become learning or intelligent for improving their competitiveness. The speed of development of universities cannot be compensated through traditional training. Therefore, there is a need for employee development and technological implementation for improving the capabilities of universities (Tortorella, Vergara, & Sawhney, 2020).

Amato, Macchi, and Tosca (2017) proposed a learning system perspective, which suggests that five systems are involved in a learning university. These five systems include technology, people, the organization, learning and knowledge. For the learning of a university, the key aspect or role is played by technology. Information technology, electronic performance support systems, and learning-based technology has rapidly transformed the way in which universities work and interact across the globe. These technological factors improve the learning of a university through the use of internet for learning activities. The use of internet technology for learning is referred to as e-learning technology. The primary factor in the diffusion and delivery of learning at the workplace is E-learning, which influences the training effectiveness (Bitzer, Janson, & Leimeister, 2018).

It has been revealed by empirical studies that there are positive influences created by e-learning on job performance and learning effectiveness (Arthur & Kariuki, 2019; Chen, Zhang, & Wei, 2019; Harrati, Bouchrika, & Tari, 2016). Moreover, a crucial role is played by e-learning in supporting learning content and communicating with learners for the sake of organizational learning (Mitić, Nikolić, & Jankov, 2017). It has been indicated by researchers that e-learning can improve the effectiveness of educational learning, as it has a crucial role to play in the learning process (Ismail & Umami, 2017). However, the positive influence of e-learning on the learning effectiveness of Indonesian universities has not been verified by studies. Further, in order to achieve the set e-learning outcomes, the service quality of the e-learning system can be a critical variable.

Therefore, the perspectives of students have been used in the current study to analyze the influence of service quality of an e-learning system and acceptance among employees for learning. For this purpose, UTAUT has been adopted, i.e. Unified Theory of Acceptance and Use of Technology (UTAUT). It is the most adopted model of technology, which has been used in the current study to analyze the intentions, attitudes, and satisfaction of employees.

The perceptions of employees are determined by service quality (Pérez, Serrano, & Piqueres, 2020). The service quality of information systems was measured by MIS by using SERVQUAL. This measurement was done for understanding the difference between perceived and expected service (Watungwa & Pather, 2018). The current study has adopted the use of ISS (Information System Success) for understanding the perception of employees from the perspective of an educational service unit of Indonesia. Educational institutes of Indonesia will get an opportunity for monitoring their e-learning services.

Namada (2017) proposed a model SLAM, i.e. the Strategic Learning Assessment Map, which has been used in the current study. Therefore, the perceptions of employees for the adoption and use e-learning technology have been studied in the current research. Secondly, the relationship between employee perceptions of learning effectiveness and e-learning in Indonesian universities has been analyzed.

LITERATURE REVIEW

A crucial role is played by information technology in communication, delivery media, and support for the learning of educational institutions (Mitić et al., 2017). Several diverse learning resources can be integrated into cohesive and powerful learning paths through internet and related technologies (Almaiah & Alyoussef, 2019). E-learning has been made possible in an educational setting because of internet technology. Innovative technologies related to internet are offered by internet technologies to improve the learning of Indonesian universities. This use of innovative technologies not just improves communication between students and employees, along with effective learning. It becomes possible to introduce the latest products, features, and services instantaneously through the high speed of internet. Therefore, employees need to acquire and utilize new information continuously (Oloruntoyin, 2020). The suitable implementation of the internet technology for strengthening skills, knowledge, and the delivery of learning content is referred as E-learning. However, it is not limited to any specific infrastructure, technologies and courses (Almaiah & Alyoussef, 2019; Oloruntoyin, 2020). A new set of tools is offered by E-learning, which may contribute in improving traditional models of learning. The notion that the success of an educational institute is enhanced through effective learning has been supported by several empirical studies (Fraihat, Joy, & Sinclair, 2020). For this reason, a crucial role is played by e-learning in the training of employees within universities.

The way in which specific technology is accepted by employees is explained by theories of technology acceptance. TAM (Technology Acceptance Model) and UTAUT (Unified Theory of Acceptance and Use of Technology) are two widely adopted theory models. Tam was proposed by Lai (2017) and UTAUT was proposed by Sagnier, Escande, and Valléry (2019). The acceptance of information technology among employees is explained by TAM. Moreover, it helps in analyzing the perceived ease of technological adoption and perceived usefulness as two critical drivers of improving technological use. Several empirical studies have supported this model (Pérez et al., 2020). However, it is doubted by critics that TAM can be used in the educational context (Coşkunçay, Alkiş, & Yildirim, 2018). It was identified that the social influence on technological acceptance is neglected by this approach.

On the other hand, the drawbacks of the TAM approach are addressed by UTAUT, as it involves the use of behaviour and psychology-related theories. Therefore, TAM is extended to fit the environment of the job. Three direct determinants of intention to use are proposed by UTAUT, which include effort expectancy, performance expectancy, and social influence. Moreover, two direct determinants of user behaviour, including facilitating conditions and behavioural intention, are proposed by this approach. The relationship under study is also moderated by four variables, which include experience, age, gender, and voluntariness of use. Considering all these facts, the UTAUT model is considered to be suitable for current research on Indonesian universities.

Based on the above discussion, it can be said that the UTAUT model is best suited for determining the success of implementing new technology in educational settings. Empirical studies have validated this approach (Khalilzadeh, Ozturk, & Bilgihan, 2017). Therefore, this research study has made use of the UTAUT model as a theoretical foundation.

A critical role is played by the perceived service quality among the employees in the e-learning adoption within Indonesian universities. In order to understand the way in which system success is influenced by service quality, the SERVQUAL scale has been developed by IT professionals to determine the service quality of the information system. In 2003, DeLone and McKean revised the ISS model (Information System Success). SERVQUAL is based on the revised model of ISS (Martins, Branco, & Gonçalves, 2019). The quality of an information system is ensured by SERVQUAL and ISS model. Both models were mixed by Martins et al. (2019) to improve the measurement power.

The following dimensions have been used to divide the constructs:

- SERVQUAL (Service Quality, SQ): The level of quality of service of the information system
- Information Quality (IQ): The qualities of output of information system including relevance, currency, completeness and accuracy.
- System Quality (SyQ): It refers to the characteristics of Performance including ease of use and response time
- Perceived Useful (PU): The degree of an information system to use feelings of employees and measure their level of satisfaction.
- Perceived Involvement (PI): It involves the influences created on educational institutions and employee's performance. PI was originally developed as an open-end question. For this reason, it was not incorporated in the current study's questionnaire.

The dynamic process of creating knowledge is referred to as organizational learning (OL), which happens with the course of time and at different levels i.e. organization, group, and individual (Ismail & Umami, 2017). The process of organizational learning develops tension in the assimilation process of new learning. New information, ideas, or actions are transferred from one level (individual) to another level (group and organization), which is referred to as feed-forward. The already acquired information is exploited that flows from the level of an organizational to groups and individuals (feed-back).

Namada (2017) proposed the Strategic Learning Assessment Map (SLAM), which derives these concepts. The key elements of OL are integrated by SLAM. OL is analyzed at different levels (organization, group, and individual). The conceptual operative framework is proposed, which involves feed-forward and feed-back. Moreover, the flow magnitudes and learning stocks are used as variables in line with the literature on OL. The three levels of OL (organization, group, or individual) are measured by the learning outcome units, i.e. learning stocks. Learning interactions are indicated by the directions of learning flows, i.e. feed-forward and feed-back. SLAM has been used in this research as OL effectiveness is measured by using OL construct.

Hypothesis Development

For the success of any institution, a key factor is information technology. Technological advancements greatly influence presentation arrangements and learning processes. The existing learning capacity of an institution determines the need for technology and its successful implementation for improving educational learning (Mitić et al., 2017).

It has been revealed by empirical studies that knowledge is successfully transferred within the workplace by information technologies, which improves learning activities and processes. Therefore, educational learning is promoted effectively (Sattari, Rouhollah, & Lashkari, 2021). Within an educational setting, information technology incorporating network learning technology is referred to as e-learning technology. Researchers have found that OL is supported by technology (Oseni, Chadhar, & Ivkovic, 2018; Sattari et al., 2021). However, it can be disabled by bad implementation or design. It has been mentioned previously that the most adopted model for determining the employees' perceptions of implementing new technology is UTAUT. It was used by Rahi and Ghani (2018) to determine the stocks of online outcomes. With the introduction of new technology, its potential and value can be analyzed through its adoption and acceptance by the individuals at the workplace. The following statements have been hypothesized based on previous literature studies:

H1: there is a positive influence of adoption and utilization of e-learning technology by employees on organizational learning.

For any educational institution, it is necessary to possess effective organizational learning (OL) to sustain its competitive advantage in the long run. The success or failure of OL depends on the suitability of the OL environment, which has been created (Chuah & Law, 2020). Both hardware and software elements are included in the OL environment. The hardware factor is the learning system, and software factors include administrative measures, leadership and any service offered by the institution.

It is crucial to specify the building units and foundations of learning in the educational context (Tortorella et al., 2020). The focus of this research is on software and hardware issues related to e-learning technology. It was indicated by Bøe (2018) that there is an influence of e-learning service on the intention of employees for promoting OL. Therefore, this research has used the ISS model to determine the e-learning service perceptions with reference to OL. The following hypothesis has been developed based on the previous literature findings:

H2: there is a positive influence of service quality of e-learning system on organizational learning.

When employees receive high-quality e-learning service, they feel encouraged to adopt it for dealing with workplace issues. In a similar way, learning becomes interesting for employees, which ultimately improves their satisfaction for adopting the e-learning system (Pérez et al., 2020). There are positive influences of service quality of an e-learning system on technological implementation (Tarhini, Mohammed, & Maqableh, 2017; Yawson & Yamoah, 2020). The service quality offered by universities affects the perception of employees and the adoption of e-learning technology by them. The following hypothesis has been developed in this regard:

H3: There is a positive influence of adoption and utilization of e-learning technology by employees on the e-learning system on organizational learning.

H4: The service quality of the e-learning system mediates the relationship between utilization of e-learning technology by employees, and e-learning system on organizational learning.

MEASURES AND METHODS

The survey data has been collected using SERVQUAL, UTAUT, and OL, which have been selected based on the literature review. The previous work done by Sagnier et al. (2019) has been used for adapting items for the use of e-learning technology and its acceptance (UTAUT).

The work done by Yawson and Yamoah (2020) was used for selecting items for service quality of an e-learning system (SERVQUAL). The work of Namada (2017) was used for deriving items for OL (organizational learning). The quoting of relative re-tested reliabilities was done from Ismail and Umami (2017). A 5-point Likert scale was adopted for the survey questionnaire for all the items. Number 1 on the scale referred to strongly disagree, and number 5 referred to strongly agree. The response rate of the study is 58 percent. The data is collected from the undergraduate student at Indonesian public universities. The time frame of the study is between June 2020 to January 2021. The SEM-PLS is employed for the data analysis, which is one of the robust statistical tool for examining the structural models (Hair, Hult, & Ringle, 2016; Ong & Puteh, 2017). It can smoothly and efficiently determine the cause-and-effect relationships. SEM acts as a powerful tool for developing statistical models and predicting the variables (Hatamifar, Darban, & Rezvani, 2018). Several scholars (Adeleke et al., 2015; Hatamifar et al., 2018; Ong & Puteh, 2017; Basheer et al., 2018; Hafeez et al., 2018; Basheer et al., 2019; Hameed et al., 2019; Muneer et al., 2019; Basheer et al., 2021; Nisar et al., 2021; Nuseir et al., 2020) argued PLS as one of the most appropriate technique for data analysis.

RESULTS

The study has employed the SEM-PLS path-modeling, that involves a two-step procedure, starting from the measurement model estimation which leads towards the structural model estimation (Asada, Basheerb, & Irfanc, 2020; Nuseir, Basheer, & Aljumah, 2020). The reliability, validity of the model is accessed using measurement model, which is shown in the figure 1 below.

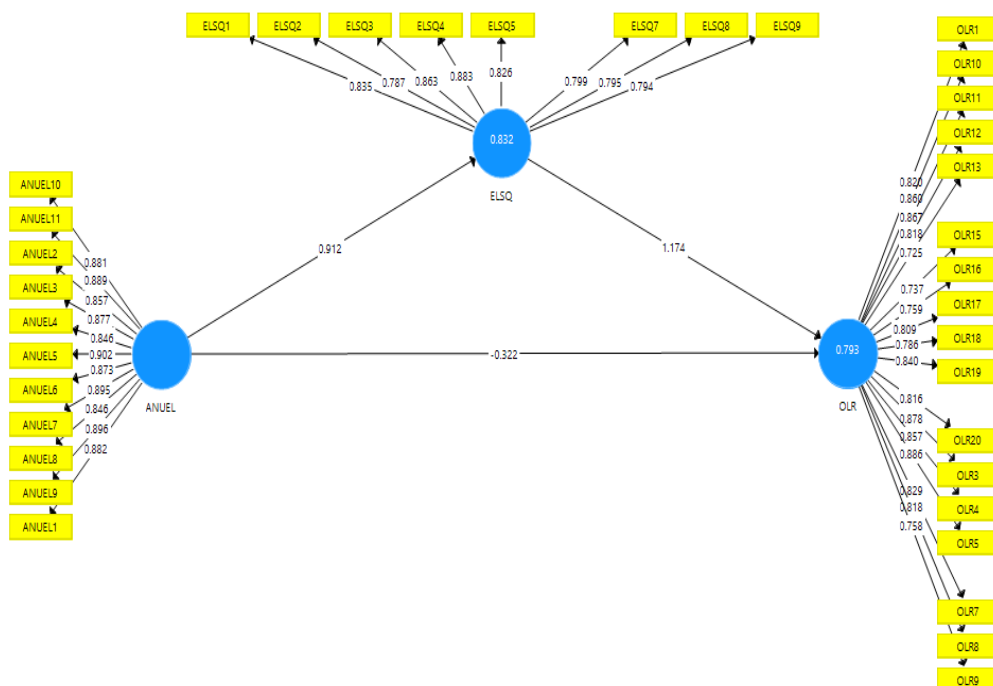


Fig.1: Measurement Model

The determination of the individual item reliability is the first and foremost criterion of measurement model is to access the reliability of individual items involved in our model. The cut of value of the individual item is determined as 0.70 (Hair et al., 2016; Ong & Puteh, 2017; Shuhaiber, 2018) and item with loading less than 0.70 are excluded from the analysis (Hair et al., 2016; Hair, Matthews, Matthews, & Sarstedt, 2017; Henseler,

Hubona, & Ray, 2016). The results of the outer loading by mean of PLS algorithm are shown in the table 1 below.

Table 1: Outer Loadings

	ANUEL	ELSQ	OLR
ANUEL10	0.881		
ANUEL11	0.889		
ANUEL2	0.857		
ANUEL3	0.877		
ANUEL4	0.846		
ANUEL5	0.902		
ANUEL6	0.873		
ANUEL7	0.895		
ANUEL8	0.846		
ANUEL9	0.896		
ELSQ1		0.835	
ELSQ2		0.787	
ELSQ3		0.863	
ELSQ4		0.883	
ELSQ5		0.826	
ELSQ7		0.799	
ELSQ8		0.795	
ELSQ9		0.794	
OLR1			0.820
OLR10			0.860
OLR11			0.867
OLR12			0.818
OLR13			0.725
OLR15			0.737
OLR16			0.759
OLR17			0.809
OLR18			0.786
OLR19			0.840
OLR20			0.816
OLR3			0.878
OLR4			0.857
OLR5			0.886
OLR7			0.829
OLR8			0.818
OLR9			0.758
ANUEL1	0.882		

The reliability and validity of the model is accessed using Cronbach's Alpha, composite reliability, and Average Variance Extracted. The results of the reliability analysis are shown in the table 2 below (Basheer, Hafeez, Hassan, & Haroon, 2018; Hair et al., 2016). The results in the table 2 confirm that there is no issue of reliability.

Table 2: Reliability

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
ANUEL	0.970	0.971	0.973	0.769
ELSQ	0.932	0.933	0.944	0.678
OLR	0.969	0.971	0.971	0.667

The validity of the model is examined using Fornell-Larcker Criterion, which says the diagonal values of validity matrix must be greater than the lower values. The results shown in the table 3 conform that the model is valid.

Table 3: Validity

	ANUEL	ELSQ	OLR
ANUEL	0.877		
ELSQ	0.712	0.893	
OLR	0.749	0.881	0.817

Once the reliability and validity of the model is established than the next step in PLS-SEM is to establish the path coefficients between and among the variables of the study (Akter, Fosso Wamba, & Dewan, 2017; Ong & Puteh, 2017). The bootstrapping procedure is used to establish the links between and among the variables (Hair et al., 2016; Henseler et al., 2016). The structural model is mapped in the figure 2.

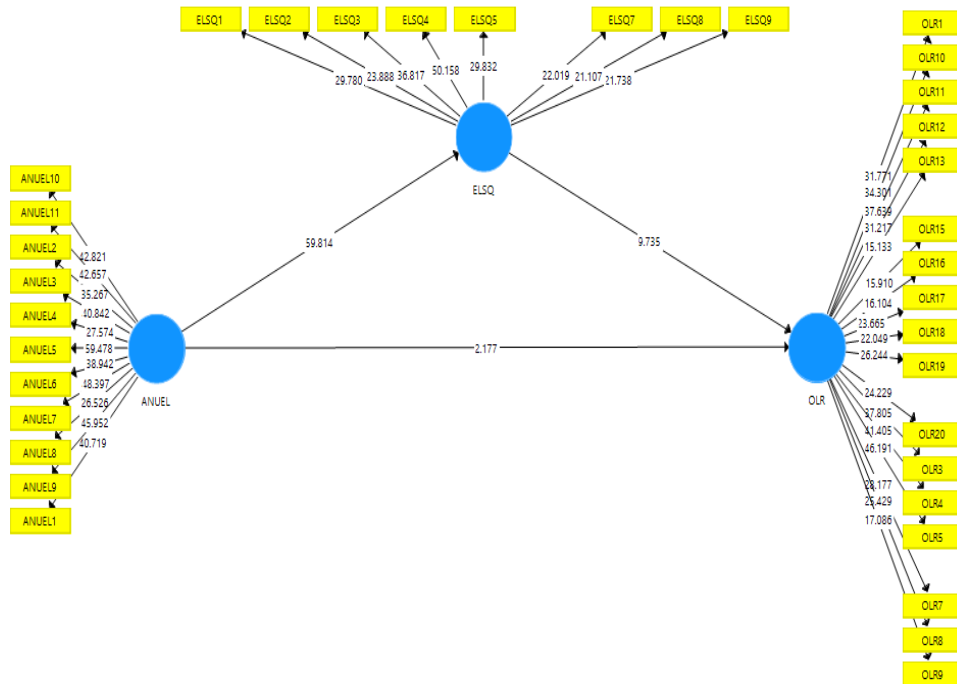


Fig.2: Structural Model

The result of direct paths are shown in the table 4. The results indicate that the all direct paths namely ANUEL -> ELSQ, ANUEL -> OLR, and , ELSQ -> OLR are significant and positive.

Table 4: Direct Relationships

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
ANUEL -> ELSQ	0.912	0.913	0.015	59.814	0.000
ANUEL -> OLR	0.749	0.750	0.055	13.651	0.000
ELSQ -> OLR	1.174	1.171	0.121	9.735	0.000

One of the objectives of the study is to examine the mediating role of ELSQ in the relationship between the ANUEL and OLR. The results of the mediation analysis are shown in the table 5 below and confirm that the mediating path ANUEL -> ELSQ -> OLR is positive and significant

Table 5: Mediation

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
ANUEL -> ELSQ -> OLR	1.071	1.068	0.109	9.814	0.000

R-square is regarded as a key criterion in structural model estimation (Adeleke et al., 2015; Henseler et al., 2016; Mikalef & Pateli, 2017; Richter, Cepeda, & Roldán 2016) and ranges from 0-1.

Table 6: R-Square

	R Square	R Square Adjusted
ELSQ	0.832	0.831
OLR	0.793	0.791

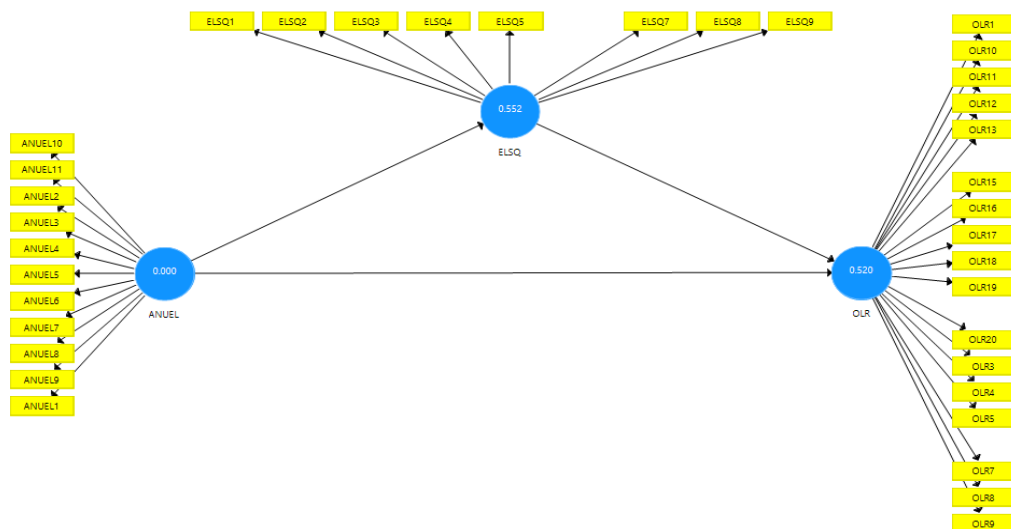


Fig.3: Blindfolding

For predictive relevance of constructs, the Q^2 value must be non-zero or $Q^2 > 0$. The Blindfolding procedure is used to measure the predictive relevance. The results of the predictive relevance are mapped in figure 3 and shown in the table 7

Table 7: Q-Square

	SSO	SSE	$Q^2 (=1-SSE/SSO)$
ANUEL	2387.000	2387.000	
ELSQ	1736.000	777.469	0.552
OLR	3689.000	1772.054	0.520

DISCUSSION AND CONCLUSION

The relationship between service quality of e-learning system, institutional learning and utilization and adoption of e-learning technology in Indonesian Universities has been examined in this research. The relationship has been investigated from the perspective of employees. The outcomes of the study reveal that the service quality of the e-learning system and utilization of e-learning technology has a direct and significant impact on organizational learning. This direct and significant influence shows that organizational learning is influenced by the quality of technology service combined with the satisfaction for e-learning. The results of the current research are in line with the results of several researchers (Oseni et al., 2018; Sattari et al., 2021). Thus, institutional learning outcomes can be enhanced by considering the quality service of the e-learning system in

the designing and implementation of e-learning technology by professionals of HR. A crucial role is played by e-learning in transforming universities into learning organizations. The effectiveness of organizational learning is accelerated by e-learning.

The findings also reveal that there is a significant and positive influence of acceptance and utilization of e-learning technology on the learning of institution. Employees are willing and motivated to use e-learning technology when they come across useful information for performing different activities. In this way, employee satisfaction is increased. For increasing employee willingness for adopting e-learning system, it is important to align the training needs of e-learning with routine activities of employees working in Indonesian universities. Employees may need a good user interface for effective adoption and utilization of e-learning technology to improve their learning.

The findings of hypothesis 3 are in line with the results of Tarhini et al. (2017) and Yawson and Yamoah (2020). It has been confirmed by this study that a positive association exists between the adoption and utilization of e-learning technology and the service quality of the e-learning system. It is indicated by these findings that e-learning satisfaction among employees is improved by the high quality service of the e-learning system.

The focus of Indonesian universities must be on service operations and e-learning management for improving the quality service of the e-learning system after the successful introduction of e-learning infrastructure. Therefore, the e-learning satisfaction of employees is increased by the high quality service of the e-learning system.

The service quality of e-learning can be measured by a useful tool, i.e. the revised SERVQUAL scale, which is based on the ISS model (Information System Success) (Yawson & Yamoah, 2020). In order to increase the level of motivation among employees, the e-learning service department should reflect a higher responsibility and maintain good relations. Moreover, the authorities must show a willingness to support employees in universities. It has been found by the study that there is significant direct influence of service quality of e-learning on organizational learning (Hypothesis 2). These results are consistent with the findings of Bøe (2018). The researcher found that there is a significant and direct influence of service quality of e-learning on the learning of institutions. However, the current study has found a significant indirect influence of service quality of e-learning on institutional learning. There is a need for extended research to understand the association between the two constructs in a better way.

It has been revealed by this research that organizational learning is directly influenced by employee satisfaction for the adoption and use of e-learning technology. However, the service quality of e-learning does not have a direct influence on institutional learning. The relationship between organizational learning effectiveness and service quality of the e-learning system has been fully mediated by the employee satisfaction of using e-learning technology. There is no direct influence of service quality of e-learning system on organizational learning. Thus, the service quality of an e-learning system should be improved by human resources and professionals of IT for enhancing employee satisfaction and effectiveness of organizational learning.

Hypothesis 2 has not been supported by the findings of the current study, which stated a positive influence of service quality of e-learning on institutional learning. The outcomes of the research confirm a direct or indirect association between organizational learning, e-learning technology satisfaction and service quality of e-learning. The idea of improving the effectiveness of organizational learning through e-learning technology has been supported by several empirical studies. Therefore, high-quality e-learning services should be provided by Indonesian universities for enhancing learning effectiveness.

Limitations of the Study

There are several limitations of the current research. The sample was based on employees working in different Indonesian universities, which may have a difference in culture and norms. These factors could have an effect on the findings of the research. Thus, employees may have a different level of satisfaction and acceptance of e-learning technology because of cultural differences. Moreover, the management of some universities was reluctant to reveal their existing technological capabilities for some reasons. This could have influenced the results as well. The information provided by the participants can be misleading. The study has been conducted with a particular focus on the universities of Indonesia, which limit the generalization of results.

Therefore, there is a need for carrying out extensive research by increasing the survey quantity and scope for improved model validation. Moreover, different dimensions of sub-contraction must be explored. The direct or indirect association between service quality of e-learning system and three levels of hierarchy in an educational setting (organization, groups, individuals) should be explored in future research.

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