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The Lecturer Quality in an Online Learning Towards Higher Education Student Satisfaction Post Covid-19

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Abstract

Aiming at exploring the quality of e-learning systems and lecturer's online learning in the Faculty of Tarbiyah and Teacher Training, this research analyzes factors affecting student satisfaction and benefits they got by employing the model of information system of DeLone and McLean. The data were collected through an online survey using Google Forms targeting 432 respondents. They consisted of students and lecturers who were active during the odd semester from August to October 2022. SEM Partial Least Square was used to analyze the data. The research showed that the quality of e-learning system positively affects learning experience, but not student satisfaction. The quality of lecturer's online learning influences student satisfaction and benefits them more than the quality of e-learning system itself. So, from the implementation of online learning model in the said faculty, the quality of e-learning/LMS affects the quality of online learning and the lecturer quality who implemented online learning influences positively and significantly on the improvement of student satisfaction and benefits. This research is influential in enhancing the quality of e-learning system synergized with the enhancement of quality and capacity of lecturer's skills in a hybrid-based learning or blended learning in Indonesian Islamic Higher Education Institution post Covid-19.

Keywords: *DeLone and McLean Model, information system, lecturer quality, online learning, satisfaction.*

Introduction

The 21st century education post Covid-19 pandemic is in need of paradigm change and the learning method that is more adaptive, creative, innovative, productive, and based on digital technology. The learning in the 21st century intends to prepare students to survive in the Industrial Revolution 4.0 and Smart Society 5.0 era. To survive, they have to build the so-called 4C skills i.e., critical thinking, creative thinking, collaboration, and communication. After the pandemic, lecturers and

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students in the Faculty of Tarbiyah and Teacher Training of UIN (state Islamic universities) all over Indonesia implemented a blended learning model, or integrated learning, which combines face-to-face offline meeting in the classroom and online learning using an e-learning model system. The model of online learning application post Covid-19 pandemic must consistently maintain the quality of services and learning. Online learning applications have several weaknesses, such as: the limited internet connection, the minimum contact and social interaction, as well as difficulty in understanding learning materials. Besides, they offer various advantages, such as the possibility of learning management with limitless space and time, whenever and wherever. Stated that online learning is more comfortable and economical (Bates, 2015). Said that the online learning system offers more flexibility and increases student satisfaction (Kratochvil, 2014). Meanwhile, according to Doust (2022), online learning application fulfills the requirement of the e-learning process and supports the improvement of Information and Communication Technology. In this context, students are motivated to learn using the online system. Based on the Directorate General for Higher Education of the Ministry of Education and Culture (2014), the success and quality of online learning require adequate network, relevant programs, and the availability of other resources. Many developing countries are attracted to integrate e-learning in their learning system but face many challenges. Found that the integration of technology and education in developing countries is complicated by politic, social, language, culture, and economic issues (Passey et al., 2016; Purba et al., 2019). Suggested, when implementing an effective e-learning system, technology, pedagogy, leadership, and individual factors should be taken into account (Sridharan et al., 2010; Amin et al., 2021). Identified several factors affecting e-learning adoption, namely involvement and interaction (Bell and Federman, 2013). Various aspects of online learning have been explored in other countries, including component-based pedagogy as stated, connection and reception between student and teacher, online interaction among participants, environment and student's experience (Kramer & Bente, 2010; Marshall, 2010; Sarsa & Solar, 2012; Uukkivi, 2016; Insung, 2011; Loh et al., 2016) . Online learning model is an alternative offering time flexibility and student satisfaction (Kratochvil, 2014). Online learning can connect contents and find wider concepts, not only it is based on computer, but also digital (Aparicio et al., 2016; Ingtyas, 2021).

In implementing online learning, it is important to consider and evaluate information system factors (Chang et al., 2011). The reliability of e-learning system can maximize material comprehension, student participation, and can succeed the e-learning implementation as a whole. The quality of online learning implementation can be viewed from the perspective of the Learning Management System (LMS), and the quality of e-learning model can be measured from, (a) factors of benefits and level of success; (b) the used e-learning system; and (c) the learning process. It is simple to say that, if the quality of learning system and process is considered adequate to meet the needs and satisfaction of customers, according to Crosby (1979), the e-learning product is deemed high in quality. As explained by Gerson (2002), satisfaction is customers' perception that their expectation is reached and exceeded. The higher the online learning quality is, the more chances users have to study and enjoy it, so the quality of service is in line with satisfaction.

The measurement of success and satisfaction on the e-learning system of the Faculty of Tarbiyah and Teacher Training is conducted using DeLone & McLean model [17], that is to measure the comprehensive components. This model measures three factors influencing the success and user satisfaction of an e-learning system, they are (1) information quality; (2) system quality; and (3) service quality. For measuring the lecturer quality in implementing online learning, the aspects are (1) learning design; (2) learning activity; (3) delivery/presentation strategy; (4) learning media and technology; (5) evaluation on learning success; and (6) service of learning assistance (Ditjen Dikti Kemendikbud 2014). The last aspect is measured using the Parasuraman service quality model, covering (a) reliability, the ability to give services accurately and reliably; (b) responsiveness, the willingness to help user or students by providing speedy, accurate, and efficient services; (c) guarantee, covering knowledge, skill, politeness or good personality, and ability to gain trust and desire; (d) empathy, giving attention needed by students; and (f) concrete (real proof), covering physical facility, tools, prices, personal performance, and written stuff (Flury et al., 1988).

The success of the online learning model is not only affected by the system and accessibility of reliable online learning, but also lecture quality in the learning environment provided by a faculty. The preparedness and ability of a lecturer in conducting online learning significantly influence the learning accomplishment of students (Wut & Xu, 2021; Ingtias et al., 2022; Amal et al., 2022). Lecturer and student have the ability and the willingness which are important for using digital technology devices, both software and hardware.

The quality of online learning demands the lecturer to be able to design learning components related to the online class community (Rovai, 2002; Bintang et al., 2022). Establishing an online community in education is realized by planning interactive learning experiences (Glazier, 2021; Amin et al., 2021), growing the spirit of mutual recognition among members, building trust (willingness to establish online community in education), creating interaction (or task-based interaction), social and emotional building, coordinating goals and objectives (in learning). Sense of togetherness in an online class is crucial to increase student satisfaction and to make them connected and involved. Many authors of previous studies found that teacher-student relationship grows the sense of community, solidarity, togetherness, and participation. One study showed that there is a relation between student's score and their teacher, as it is proven to be the important factor for student satisfaction in an online learning (Bonk, 2016 ; Purba et al, 2019; Luo et al, 2017).

Preparedness and ability of a lecturer in doing online learning significantly influenced student's accomplishment in learning (Wut & Xu, 2021). Lecturer and student have the ability and the willingness which are important for using digital technology devices, both software and hardware. The quality of online learning demands the lecturer to be able to design learning components related to the online class community (Rovai, 2002). Establishing an online community in education is realized by planning interactive learning experiences (Glazier, 2016; Sutiah et al., 2021), growing the spirit of mutual recognition among members, building trust (willingness to establish online community in education), creating interaction (or task-based interaction), social and emotional

building, coordinating wish and objectives (in learning). Sense of togetherness in an online class is crucial to increase student satisfaction and to make them connected and involved. Many authors of previous studies found that teacher-student relationship grows the sense of community, solidarity, togetherness, and participation. One study showed that students appreciate the relation with their lecturers which is proven to be the important factor for student satisfaction in an online learning (Ali & Ahmad, 2011; Gray & DiLoreto, 2016; Bishwas, 2020).

The study on online learning using the information system model by DeLone and McLean has been conducted by many researchers. Some of them are Holsapple and Lee-Post (2006), Lee-Post (2009), (Freeze et al, (2012) who found a very helpful and perfect model to evaluate online learning from the perspective of information systems in developing countries. The objective of this research is to evaluate the lecturer quality in online learning using an e-learning system in the Faculty of Tarbiyah and Teacher Training of UIN all over Indonesia. The researcher analyzed the factors influencing the success rate of applying an e-learning system and the quality of lecturer's teaching performance on student satisfaction and achievement, using the information system model by DeLone and McLean. This study result is to ensure that e-learning platform and lecturer constantly become the effective media for keeping up with the education model after the Covid-19 pandemic.

Research Method

Data and Sample

The research data were collected during the odd semester from August to October 2022. The informants are students and lecturers of the Faculty of Tarbiyah and Teacher Training from several UINs i.e., Malang, Bandung, Surabaya, and Yogyakarta. The data were collected online using Google Forms shared to 432 students and lecturers. The majority of respondents from students are those in undergraduate level (73.1%), and the rest are from graduate level (25.9%). The percentage of male and female respondents are 51.6% and 48.4% respectively. The majority of e-learning users are students from the 2021-2022 batch (50.1%), while 49.9% are students from the earlier batch. From the aspect of time proportion of e-learning use, those using more than a year (<1-3 years) are 57%, and the rest are less than a year.

Measurement

Answering every question, respondents voluntarily explained the implementation of the e-learning system and quality learning of the lecturer by giving evaluation scores based on their experience. Score 1 = very low, score 2 = low, score 3 = moderate, score 4 = high, and score 5 = very high. The data from 432 respondents were analyzed using Partial Least Square (PLS), particularly SmartPLS 3.0. The PLS analysis was done in two procedures (Rodriguez-Entrena et al., 2018; Long et al., 2019) first, examining the model and the measurement consisting of validity and reliability, and second, examining the structural model using the information system model by DeLone and McLean, as presented in Figure 1.

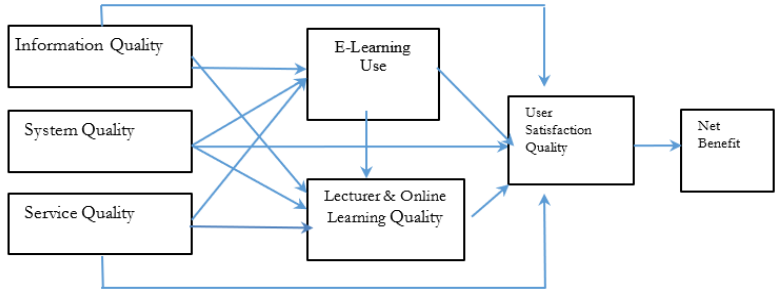

Figure 1 Modified information system success model by DeLone and McLean [17]

Result And Discussion

Online Learning Application

Descriptively, based on the survey results, e-learning use in online learning applied in the Faculty of Tarbiyah and Teacher Training (known as FITK) of UIN Malang, Bandung, Surabaya, and Yogyakarta, is shown in diagrams. In Figure 2, regarding the Information Quality, most respondents said that the variable is good (48%), those answering "very good" are included in 30.1%, and the rest answer adequate and lacking. Regarding the Service Quality, the majority of respondents said that it is good (46.9%), 26.5% said the service is very good, and the rest (26.5%) said that the service is adequate or even lacking. 45.1% respondents considered the Use Quality is good (45.1%); those giving adequate and lacking scores are 32.2%, meanwhile, 22.5% said that it is very good.

Overall, the said condition describes that the e-learning system quality applied in FITK is considered decent, yet it has not reached the level of optimal or very good. The condition is more on the adequate or even lack side, so the quality of the e-learning system obviously needs improvement based on the needs of online learning and student satisfaction on learning outcomes in the university.

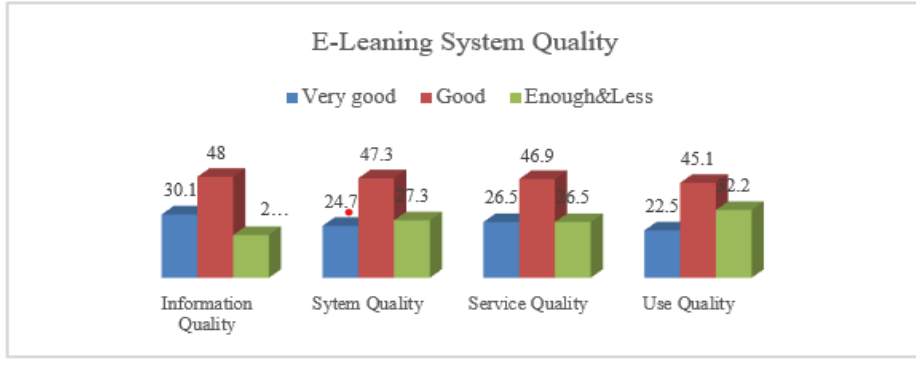

Figure 2 Conditions of E-learning System Quality at FITK

The Quality of Lecturer in Online Learning and Student Satisfaction

The survey results on lecturer quality in online learning were exhibited in Figure 3. In terms of tangible quality, the majority of respondents considered it good (44.4%), some said it is very good (28.1%), and the rest thought it was adequate or lacking (7.4%). In terms of reliability, the majority said that it was good (47.3%), meanwhile others said it was very good (26.3%) and adequate/lacking (26.7%). The lecturer's responsiveness, according to the respondents, was good (47.3%) and only 25.8% thought it was lacking. Lastly, the lecturer's empathy was also said to be good (46.7%), and only 23.9% gave adequate feedback.

From Figure 3, we learn that the lecturer quality in online learning employing the e-learning system applied in FITK, based on the conducted survey, is considered good, yet it is not optimal or very good. The quality tends to be lacking according to the results, that the lecturer quality in online learning calls for improvement for the sake of enhancing student satisfaction in learning outcomes, as well as the benefits.

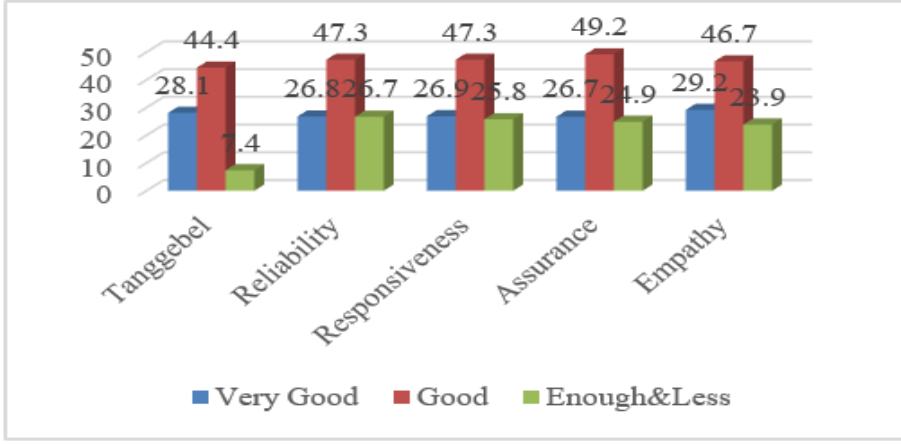

Figure 3 Lecturer Quality in Online Learning

All in all, from the implementation of e-learning in the Faculty of Tarbiyah and Teacher Training post Covid-19 pandemic, based on the loading factor point of the survey response, the system and the lecturer quality have moderate functional point/score (mean > 3.9). The indicator result of loading factor from LMS e-learning system quality, respectively, shows that the lowest score belongs to system quality and service quality; meanwhile the highest score is on information quality. In the system quality, speed, reliability, use, and adaptability are prioritized to advance, mainly on the ability to adapt since it still has less impact. Trust and empathy must be increased in the forms of service quality, meanwhile, security, punctuality, and schedule should be taken into consideration and improved in the forms of information quality. The personalization indicator should be maintained because it is the dominant factor influencing the development of information quality. Further data are presented in Table 1.

Table 1. Conditions Implementation Online Learning : Quality Systems , Information , and Services

Construct	Indicators	Mnemonic	Means	*Factor loading*	*Composite reliability°*	AVE'
Information Quality	*Completeness*	IQ1	4,086	0879	0.949	0.699
	Clearly written	IQ2	4,032	0.863		
	Personalization	IQ3	4,000	0.882		
	accuracy	IQ4	4011	0.865		
	Timelines	IQ5	4,054	0.805		
	Relevance	IQ6	4,022	0.860		
	up-to-date	IQ7	3,914	0.785		
	security	IQ8	4,226	0.738		
		Means	*4, 043*			
Systems Quality	*usability*	SQ10	3,925	0.855	0.916	0.733
	Adaptability	SQ11	3,882	0.871		
	reliability	SQ12	3,903	0.851		
	Speed	SQ9	3,968	0.847		
		Means	*3,919*			
Service Quality	*Responsiveness*	SEQ13	3,968	0.924	0.942	0.845
	assurance	SEQ14	3,957	0914		
	Empathy	SEQ15	3,957	0.919		
		Means	*3,960*			

Furthermore, in terms of Use Quality, the lecturer quality in an online learning affects the student satisfaction and benefit. The result of the Use Quality of e-learning as an external factor needs to be increased since it gives the lowest contribution. Moreover, the lowest quality of e-learning interface becomes a problem of instructional practice, developing materials using powerpoint slides or other media, as well as the availability of learning tutorials and instruction. While the indicator for using case study needs to be maintained because it is the dominant factor influencing the use of the e-learning interface.The ability of the lecturer in designing and developing quality of online learning designs is the lowest indicator of lecturer quality in online learning. Quality evaluation of learning success must be considered and increased. The quality of presentation strategy needs to be maintained because it is the dominant factor affecting the lecture quality in online learning. On the service quality dimensions (reliability, responsiveness, assurance, empathy and tangible), tangible is relatively the lowest indicator, whereas empathy is the highest indicator, but empathy has the lowest loading factor value, while tangible has a higher loading factor value than the others. It shows that the lecturer quality in online learning, especially on empathy and tangible indicators, needs to be increased. Sequentially, the priorities for increasing the learning quality can be started from empathy, then tangible, assurance, reliability, and responsiveness. Student Satisfaction is considered good. Students are able to engage with the material and get more learning experience by using e-learning. In addition, students also stated that they had flexibility in study time. This is stated in Table 2.

Table 2 Conditions of Usage, Learning Quality, Users Satisfaction, and Net Benefits

Construct	Indicators	Mnemonic	Means	*Factor loading*	*Composite reliability°*	AVE'
Use Quality	Powerpoint slides	KP16	3,871	0.856	0.960	0.776
	Audios	KP17		0.881		
	Scripts	KP18	3,753	0.911		
	Discussion board	KP19	3,796	0.894		
	Case studies	KP20	3,882	0.905		
	practice problems	KP21	4,054	0.855		
	Excel tutorials	KP22	3,882	0.861		
		Means	*3,857*			

The quality of lecturers in Online Learning	Online learning design *Quality*	TG23	3,882	0.902	0.954	0.807
	Online learning activities *Quality*	RB24	3,914	0914		
	Delivery strategy *Quality*	RS25	3,968	0917		
	Learning media and technology *Quality*	AS26	3,989	0.902		
	Evaluation of learning success *Quality*	EM27	4,032	0.854		
		Means	*3,957*			
User Satisf action	Overall satisfaction	US28	3,871	0.911	0.961	0.803
	Enjoy able experience	US29	3,763	0.887		
		US30	3,753	0.901		
		US31	3,796	0.928		
		US32	3,882	0.897		
		US33	4,054	0.851		
		Means	3,853			
Benefit	Enhanced learning	NB34	3,935	0.904	0.959	0.795
	Empowered	NB35	3,903	0.895		
	Time savings	NB36	3,957	0.909		
	academic success	NB37	4,032	0.932		
	Cost efficiency	NB38	3,914	0.817		
	Overall success	NB39	4/011	0.888		
		Means	*3,958*			

The Influential Factors on the Success of Online Learning

Structural equivalence modeling using SmartPLS 3.0. revealed that Mardia's multivariate test for data normality showed significant skewness (β = 6.33, p 0.00) and kurtosis (β = 144.49, p 0.00), so that PLS-SEM is relevant for data processing [33]

The reliability and validity measurement models (convergent and discriminant) were tested based on the results of the PLS algorithm using a number of indicators. R2 and f2 values were used to evaluate the description of strength and size of the model effect. In using PLS-SEM, the Stone-Geisser test was performed to ensure the strength prediction of the model.

Assessment of the Measurement Model

All measurement items contain construct validity and meet the convergence validity (Table 3). Alpha Cronbach value was around 0,87–0,95 from the established construct reliability.

Composite Reliability (CR) was achieved because all signs were above the threshold value of 0,7 (Hair et al., 2010). Estimated mark extract average variance is much larger than mark threshold limit 0,5. Thus, there is sufficient evidence about the validity of convergent measurement models.

Assessment of the Structural Model

There is no evidence of multicollinearity because the variance inflation factor (VIF) score as shown

in Table 3 is lower than the threshold value of 3,3. The Stone-Geisser test shows that all endogenous latent variables have high predictive power because all Q2 values (0,99) exceed the threshold value of 0,35. This model also has a high-powered explanation because it produces high R2 value as in Table 3.

Table 3 *Results of the Structural Model*

No	Relationships	Path coefficient	P values	*f*2	
1	Information Quality -> User Satisfaction	0.148	0.396	0.467	2. 2 4
2	Information Quality -> Online Learning Quality	0.570	0.000	0.053	2.2 1 _
3	Information Quality -> Use Quality	-0.069	0.633	0.701 _	1.35
4	User Satisfaction -> Net Benefit	0.621	0.000	0.047	1.35
5	Online Learning Quality -> User Satisfaction	0.419	0.013	0.104 _	1.21
6	Online Learning Quality -> Use Quality	0.589	0.000	0.335	1.36
7	Online Learning Quality -> Net Benefit	0.348	0.000	0 .12	1.52
8	Use quality -> User Satisfaction	0.232	0.138	0. 00 2	1.25
9	Service Quality -> User Satisfaction	0.262	0.059	0. 0 62	1.58
10	Service Quality -> Online Learning Quality	0.000	0.998	0. 0 14	1.54
11	Service Quality -> Use Quality	0.232	0.038	0.467	2. 2 4
12	System Quality -> User Satisfaction	-0.168	0.376	0.701 _	1.35
13	System Quality -> Online Learning Quality	0.308	0.040	0.335	1.58
14	System Quality -> Use Quality	0.195	0.136	0.053	1.54

Table 3 and Figure 4 show that the 14 hypotheses are supported by the quality of information which has positive and significant relationship with the quality of lecturer in online learning. The quality of learning has significant effect on the use quality and user satisfaction. In addition, the quality of learning and user satisfaction have positive and significant effect on the net benefit received by the students. Whereas in the e-learning system, service quality has positive and significant effect on the use quality as well as on the learning quality because p <0.05. However, the impact of service quality on use and learning quality might be influenced by factors like user demographics, learning styles, and course content complexity. Exploring these nuances can further optimize e-learning design for different audiences." Regularly evaluating both user satisfaction and service quality becomes crucial. By addressing identified weaknesses and iteratively refining service approaches, e-learning platforms can maintain their positive influence on learning outcomes and student benefits.

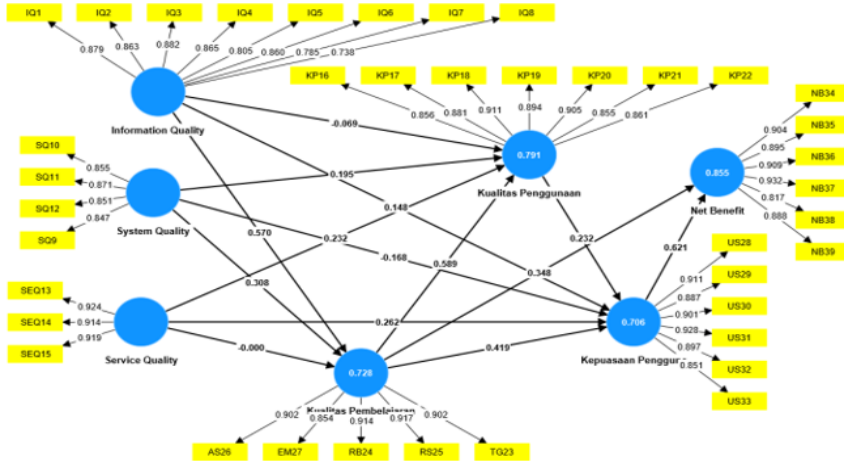

Figure 4 Structural Model Results

Information Quality has a positive but not significant relationship to User Satisfaction. It also happens in Information Quality to Use Quality, Service Quality to User Satisfaction, Service Quality to Learning Quality, and System Quality to Use Quality because p> 0.05. Information Quality does not show a positive relationship and does not have a significant effect on the Use Quality as well as System Quality on User Satisfaction because they have negative correlation, p value> 0.05.

The variables of Information Quality, System Quality, Service Quality, Use Quality, Online Learning Quality and User Satisfaction revealed 85.5% of net variation results. Information Quality, System Quality, and Service Quality variables revealed 79.1% of Use Quality variation. The variables of Information Quality, System Quality, Service Quality, and Use Quality revealed 72.8% of Learning Quality variation. The variables of Information Quality, System Quality, Service Quality, Use Quality and Learning Quality revealed 70.6% of User Satisfaction variation. Figure 4 shows that the effect of student satisfaction on the lecturer quality in online learning has the largest coefficient value, 0.419. While students satisfaction on the net results has coefficient value of 0.621.

Discussion and Implication

Digital-based learning has emerged as an important component of the education system in Indonesia. Primarily, the blended learning model in Higher Education post Covid-19 pandemic has become a necessity and has been integrated. However, assessing the success of online learning in Indonesia is challenging because of differences in the preparedness of the lecturer in implementing the e-learning model and the quality of e-learning implementation in Higher Education. Recent studies reported contradictory results regarding the success and effectiveness of online learning in Indonesia.

In order to explore the satisfaction and benefit in the post-Covid-19 online learning participation,

the Faculty of Tarbiyah and Teacher Training at UIN all over Indonesia shows that the quality as well as the learning model of lecturers in terms of (a) learning design, (b) learning activities, (c) delivery strategy, (d) learning media and technology, (e) evaluation of learning success, and (f) learning assistance services are in accordance with the dimensions of service quality (Reliability, Responsiveness, Assurance, Empathy and Tangible). They have a strong relationship with reliable e-learning system support, so that high satisfaction and benefit can be reached. These results support research by Chen et al., (2020) which stated that the availability of e-learning system and platform plays a major effect on user satisfaction. It requires the support of the Learning Management System (LMS), lecturer and student e-literacy, learning culture, and blended learning for adaptive and comprehensive e-learning development (Sutiah, 2020). In addition, it is necessary to improve quality of the program (Marciniak, 2018) and e-learning implementation policy to overcome its implementation gaps, such as funding and cost issues, human resource, and desired skill by providing e-learning educational curriculum standard, government role as supervisor, and continuous improvement to increase student satisfaction (Tanye, 2018; Natsir et al., 2022; Ampera et al., 2020).

The results of this research indicate that the students get high satisfaction and benefit when the lecturer quality in online learning is supported by the quality of e-learning system, though a number of students face some problems related to information technology resources such as facility and network. This is in line with the findings of Aboud and the previous research (Aboud, 2021; Abbasi et al., 2020; Alqahtani et al., 2021). The research also revealed that Information Quality, System Quality, and Service Quality have positive relationship but do not have significant effect. Moreover, this research confirms DeLone and McLean (1992) opinion which stated that System Quality and good Information Quality affect Use System and User Satisfaction. The results of a research by Istiningsih and Utami (2009) also stated that Information Quality has no positive and significant effect on User Satisfaction. The use of e-learning system will achieve satisfaction if it has good quality and is implemented by lecturer who has capability in conducting online learning. This shows that user will be satisfied if the e-learning system provides easy-to-understand guidelines, presents material that fits the learning needs, supports the learning process, is easy to operate, and makes communication between lecturer and students more intensive, as well as ease in accessing e-system features. On the other hand, when the system provided by e-learning has low quality, it will affect User Satisfaction.

Furthermore, the findings of this study indicate that Information Quality has positive and significant relationship with Learning Quality. It also has positive and significant effect on User Satisfaction and provides net benefit to students. The variables found support the lecturer quality in online learning. They include: (1) instructional design, (2) learning activities, (3) delivery strategies, (4) learning media and technology, (5) evaluation of learning success, and (6) online learning support services. These variables provide dominant influence on student satisfaction and net results or net benefit received by students. The role of lecturers in providing Service Quality in

e-learning is the key to student satisfaction in achieving learning success. This is in line with Wut & Xu's research which stated that the fundamental factors in implementing online learning model are the lecturer willingness and capability to understand the use of digital technology devices, both hardware and software (Wut & Xu, 2021). The lecturer must be responsible for designing interactive learning experiences in online classes (Glazier, 2016). This finding is in line with a research conducted by Jawad and Shalash (2010) which revealed that the implementation of e-learning strategy can increase student academic achievement. Student satisfaction (Asoodar, 2016) is influenced by teaching models, knowledge acquired, and methodological assessments applied in online learning. Data from previous studies have emphasized the importance of blended learning in student achievement (Alshawish et al., 2021; Alvarez et al., 2017; Leidl et al., 2020). Blended learning is different from e-learning, which allows the lecturer to integrate technology with traditional face-to-face and virtual learning.

In addition, this research found that the e-learning system, the lecturer quality in online learning and the student satisfaction have positive and significant effects on net benefits or various benefits of online learning for students. These benefits include saving money and time spent on transportation and being able to spend more time with family, being able to study comfortably, and having more time to sleep or rest (Suliman et al., 2021; Tang et al., 2015). Students also stated that online learning makes them more independent in learning, improves critical thinking and problem solving skills, and also encourages self-reliance (Suliman et al., 2021; PS et al., 2022; Tang et al., 2015; Button wt al., 2014; Sinaga et al., 2018). The findings of this research confirm and develop the theory of Parasuraman et al. (1985) which stated that service quality is a comparison between the service quality perceived and the quality that should be provided. He stated that service quality depends on the difference between expected and perceived service. If service expectation is higher than service perceived, it means that the service is unsatisfactory. If service expectation is lower than service perceived, it means that service quality reaches satisfaction level. Moreover, the findings of this research also confirm and develop research conducted by Kositanurit et al. (2006), Halawi et al. (2007), Petter et al. (2008), which stated that a meta-analysis study uses the model (Kreimer et al., 2010) to determine whether the model has been validated by the previous research. The results of this research also revealed that when users utilize the provided e-learning system, the process of downloading lecture material is fast. Assessment of online learning is similar to conventional lectures. In addition, the e-learning management unit is easy to contact when users experience problems in accessing the system.

Implication

Education must provide and facilitate the success of a quality learning process in accordance with the needs and developments in the era of industrial technology 4.0 and smart society 5.0. In the post COVID-19, many online learning models were used in the education system (Alqahtani et al., 2021; Muvid et al., 2023). In this context, the lecturer quality must be improved according to the developed e-learning system because it has implications for the development of learning theory

and future learning model in an environment supported by scientific and technological developments. Online learning does not only disrupt traditional teaching practice, but also allows lecturers to adapt to the demands of increasing the competence, skills and learning culture of lecturers and students in developing new ICT-based learning model. Failure to meet student expectations in developing quality and learning systems in this digital era can lead to learning failure. Thus, the students satisfaction and benefit from several aspects demand the preparedness of the lecturer quality in the application of blended learning and e-learning system as indicators of the quality and effectiveness of online programs.

Faculties of Tarbiyah and Teacher Training in Indonesian Islamic Higher Education need to know whether the students are satisfied with the learning experiences gained. Comprehensive and continued investigations are needed to adopt appropriate policies for the continuity of the education system. This research aims at encouraging the creation and development of innovative and diversified blended or hybrid learning models. Therefore, Higher Education must continue to strive to develop synchronous or asynchronous learning models as needed to increase the satisfaction and benefit of student learning success.

This research requires further action through seminar and training session to introduce innovative teaching techniques as well as alternative assessment plans for lecturers and students based on innovative and diversified hybrid learning models. This research is also able to help educational institutions in developing effective online communication techniques while helping them manage information quality, system quality, and service quality during online learning. Lecturer must be involved in promoting collaboration and conversation among students. This research has fostered e-learning institutional policies to improve learning design models, provide support and assistance, and also provide further analysis. In addition, this research can implicate in guiding government and university investment decisions in allocating funds for the development of important educational infrastructure in new normal.

CONCLUSION

Overall, the lecturer quality in online learning affects the use quality of e-learning system. The information quality, system quality, and service quality have positive and significant influence on the students satisfaction and benefit in learning success. The effect of instructional quality is stronger than that of the e-learning system with a trust level of 97.5%. Significantly, if the lecturer quality in online learning is increased, so the user satisfaction increases by 9.12% and net benefit increases by 9.27%. This research proves an important factor in the lecturer quality of learning which must be supported by new capabilities, skills and learning culture in using the e-learning system to increase the satisfaction and benefit of online learning. This research suggests development of innovative and diversified hybrid learning model by strengthening teaching capacity and a virtual learning culture in the educational environment. This research has an important impact on the development of e-learning system through increasing the capacity of

lecturers and implementing a new learning culture with a combination of online and offline learning at Indonesian Higher Education post Covid-19.

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