

Service quality model analysis on the acceptance of information system users' behavior

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ABSTRACT

Website technology have created both opportunities and challenges for higher education. Information systems as online learning medium need to pay attention to access, quality and user needs in order to improve the quality of e-learning services. The research objective is to determine user acceptance of the system. The service quality method as identification in solving problems. The research focus on the analysis of five dimensions namely measurable, reliability, responsiveness, assurance and empathy. The research was conducted at the research college at Muria Kudus University. The results state that the assessment model of a system on the website can be completed properly. The level of effectiveness is carried out with respondents as users through the distribution of questionnaires. The results of the analysis with a statistical correlation performance test of 0.985 were declared accepted with a validity level of 97% indicating that the success of the system implemented was from the acceptance side. The higher the empathy with service quality and performance expectations, the greater the student's intention to receive online education services. This research is a reference for developing information systems on e-learning.

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1. INTRODUCTION

Digital learning has been implemented in learning, but not many have paid attention to the needs of technology for its users as material for recommendations and further improvements. Evaluation is conducted to determine effectiveness in management. Quality can be said to be good if the system is tested during its implementation. Improvements are used to measure the quality of operation and the level of user usage. Effectiveness of social media with edmodo and personal blog with WordPress in developing teacher technology skills based on gamification [1]. The problem is that there are medium online learning/massive open online courses (MOOC) providers that do not pay attention to access, quality and equality from users, so it is necessary to measure MOOC performance [2]. The role of information and communication technology in online learning is very important, so it is necessary to pay attention to quality, access, and user needs [3], argues that the evaluation of e learning performance including the evaluation of interaction in the classroom (traditional), evaluation of pedagogical actions, evaluation of administrative management and evaluation of multimedia resources. Improvement of e learning services to support continuous education performance. The main indicator of successful website development is increased user satisfaction. This study is based on a quality

model of learning management system and lecture materials, so that the contribution as an online learning medium can be fulfilled [4]. The application of effective e-learning as a means of online learning information systems at universities also depends on the level of student needs in using technology [5]. The quality of service and the availability of technology as a means of information system infrastructure can support sustainability education [6], [7].

Service quality model can be applied to all organizations, including self service that has been done by [8], where the contribution of this study uses a causal statistical model on the acceptance of learning management system instructors. Five main factors, namely the quality of learning, instructors, information, systems, and institutions as a determinant of the performance of e-learning services have an effect on perceptions of usefulness by 71.2% and academic achievement of 70.6% in e-learning system learning [9]. Analysis of academic services using the five dimensions of Servqual has been carried out in research [10]. The test results obtained an accuracy rate of 91.07% with a degree of error of 8.93% indicating student satisfaction in higher education performance can be seen from a good work environment. Another research that has been conducted by Altuntas on system acceptance uses the service quality scale and the analytical hierarchi process method. The proposed classification model to determine the impact of the parameters of each service element. The results prioritize the main factors of service [11]. Service quality is widely used to evaluate the quality of library institutions, the five elements used include tangibles, reliability, responsiveness and assurance and empathy. The average expected value of each attribute is identified as a deficiency. Tests are carried out by statistical test tests [12]. Educational technology quality services need to pay attention to the quality, access, and equity of learning at lower costs and the availability of relevant content. Mobile technology has relevance to student acceptance of m-learning [13].

The acceptance of information technology based on an integrated meta-analysis of artificial intelligence (AI) to predict the behavioral intentions of users of customer relationship management (CRM) organizations through a study of the activities of online media providers that have an impact on user satisfaction has been carried out in research [14]. Acceptance of technology on the usefulness of e-learning, social, and organizational factors influence the intentions and behavior of users of information systems [15]-[17]. The structure of the assessment model as a general research framework through the design science paradigm approach in the IS research framework from other models such as unified theory of acceptance and use of technology (UTAUT) can be a reference for new methodologies [18]. Understanding the framework is a major factor in the modern era in technology, one of which is in the process of achieving academic achievement [19]. The innovation of trends business information systems from various fields provides great opportunities such as cost finance, performance expectations, motivation and social influence. This research study was conducted by Zwain where the results showed an increase in targets in all segments in building higher education [20]. The development of learning in the 5.0 revolution era has a positive impact on sustainable education. The role of educational service quality in blended learning shows that 87.34% of students feel satisfied using information systems [21]. Another effort that needs to be considered is the management of universities. One of them is the fulfillment of infrastructure to support the services of the human resource community [22]. Acceptance assessment on the website can also use the Delphi Fucom algorithm, differences in quality gaps obtained significant results on user behavior [23], [24]. The education sector is a concern for all parties, so it needs to be improved to meet the management needs of a system and analyzing user perception factors [25]. Website quality affects user ease which has a positive impact on students' behavioral intentions to use commercial online tutorials [26].

Based on the description of previous research, this study focuses on the service quality (ServQual) model because this tool is related to online information system services, and is focused on assessment after using an online learning system. The service quality method can be used to evaluate the acceptance of the website system with five dimensions to obtain the results of the validity of user perceptions of the services received. Both of these models can be used as a measurement through the quality of service from the attributes of each dimension, so that the gap value will be obtained which is the difference between the user's perception of the service received and the user's expectation of the service that will be received.

2. METHOD

This study uses quantitative methods. The data was obtained through an online questionnaire distribution survey. The location and subject of the research were carried out at the research university institution, namely Muria Kudus university. The focus of the research is on students using the SUNAN e-learning website. This research was conducted in three stages. The first stage; determines the ServQual dimensions. The scale includes five dimensions, namely tangibles describing physical facilities, equipment, and appearance of personnel and the presence of users, reliability namely the ability to provide accurate and reliable services, responsiveness namely the willingness to help users and give proper attention, assurance is a service facility that provides trust and confidence, and empathy includes caring and individual attention to

users. The second stage is compiling and distributing questionnaires. The third stage is processing the data from the questionnaire. The data from the distribution of the questionnaires before being analyzed with validation and regression performance tests. Quantitative data calculation using SPSS version 26 [27]. Specifically, the research stages used are shown in Figure 1.

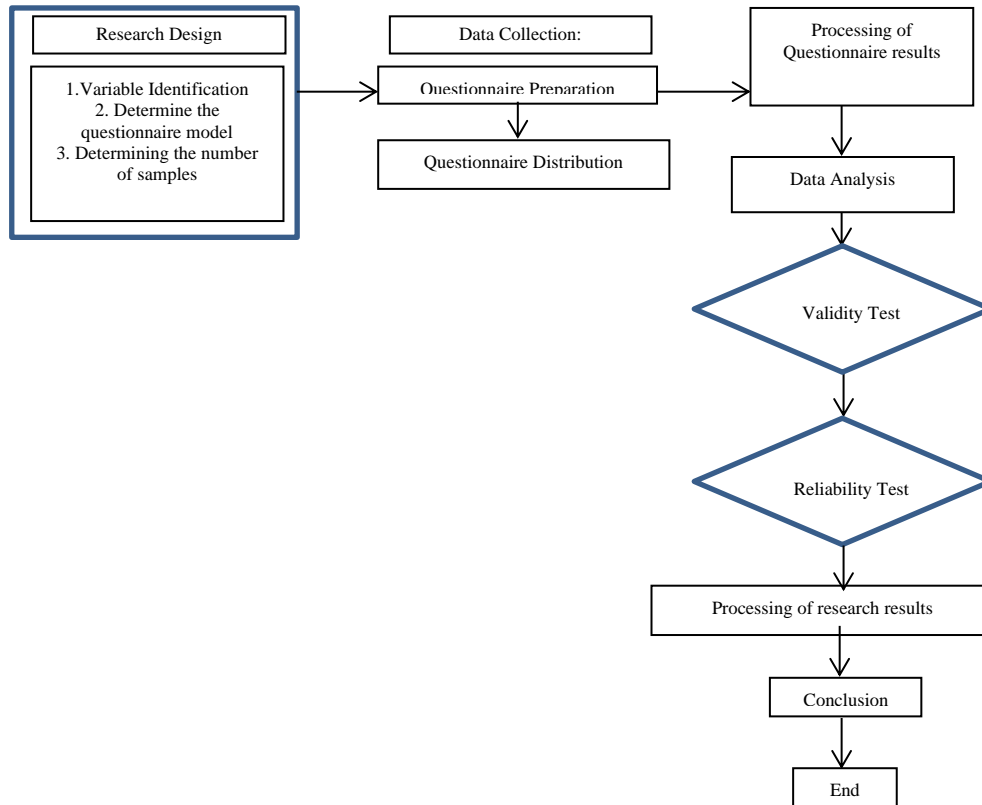


Figure 1. Research stages

At the research stage, the research design begins with the identification of variables and dimensions to be measured, consisting of independent variables (X_n), including tangibles (X_1), reliability (X_2), responsiveness (X_3), assurance (X_4), and empathy (X_5). while the dependent variable (Y) is the satisfaction of users of information systems. Each dimension has several questions and is answered in a value range of 1 to 5, where the number 1 represents feelings of strongly disagree (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), and a scale of 5 (strongly agree) with a total of 14 questions. The questions on the questionnaire are adjusted to the service quality (ServQual) model. The next stage is collecting data from the results of distributing questionnaires, and finally, data processing with data analysis and validity and reliability tests.

3. RESULTS AND DISCUSSION

Collecting respondent data from as many as 8,000 students who use the e-learning system in the even semester of 2021–2022. Filling out the questionnaire at the end of the semester period through online distribution using a tool in the form of a Google Form Respondents who returned and filled out the questionnaire were 6413 (80.16%). This questionnaire consists of two parts. The first section includes respondents' demographic information, such as gender, study program, frequency of e-learning access, and average time spent e-learning. The second part contains statements related to the variables studied in this study, including content suitability, content benefits, content completeness, system ease, access speed, attractive appearance, structured display, easy-to-understand material content, discussion forums, availability of content for submitting assignments, content to collect exam questions and answers, control of online learning, learning motivation, and convenience using SUNAN e-learning. The questionnaire consisted of 14 questions, which were further grouped according to the parameters of each question into five separate dimensions. The classification is as shown in Table 1.

Table 1. Validity test

Code question	Question	ServQual/Variable dimension	Score (1-5)
Q1	Does SUNAN's e-learning system provide content that fits the needs	Tangible (X)	
Q2	Does the SUNAN website contain useful content		
Q3	Is the SUNAN application content completing enough		
Q4	Is SUNAN's e-learning system easy to use		
Q5	Access speed (When accessing SUNAN e-learning is stable and smooth)	Reliability (Y)	
Q6	The appearance of the SUNAN class is made interesting	Responsiveness (Z)	
Q7	The appearance of the SUNAN class is structured/systematic		
Q8	Are the features on the task menu on the SUNAN website easy to understand		
Q9	The interaction facilities between lecturers and students available in the SUNAN class are quite complete	Assurance (T)	
Q10	There is an evaluation facility for learning outcomes	Empaty (U)	
Q11	In the SUNAN class, an evaluation of the implementation of lectures is carried out at the end of the meeting		
Q12	SUNAN's e-learning makes it possible to control the online learning process		
Q13	Does the interactivity of learning through SUNAN's e-learning increase motivation/enthusiasm to learn		
Q14	Is SUNAN's e-learning media provide communication between lecturers and students and fellow students		

After the next grouping, test the validity. The results of the validity test are used to measure the variables assurance, responsiveness, reliability, facilities, and empathy. Reliability was carried out with a normal distribution test, and the correlation of the correlated variables was 0.01. Thus, all statement items, according to the variables, indicate the level of valid information system users. The results of the respondents' reliability test analysis resulted in a normal distribution coefficient (Cronbach's alpha) above 0.9. It can be said that the instrument used to measure the five variables has high reliability, as shown in Table 2.

The next stage is hypothesis testing. The proposed hypothesis has been accepted with a significance level of 95%. The correlation is obtained by measuring linear regression analysis with the value of the respondent's data and five variables. Based on the analysis, it is known that the variables assurance, responsiveness, reliability, facilities, and empathy have a significant effect on users. Overall, the five dimensions of servqual are able to explain the effect on users by 37.6%. The results of the regression analysis are shown in Table 3. The presentation of data in descriptive analysis produces data on the minimum value, maximum, mean, standard deviation, data range, and total score. In the statement of the fifth item (X5), it is significant towards empathy (U) with a total of 6413 respondents, an average of 3.99, the standard deviation is 1.1, and the data range is 3. Dimension U is the dependent variable. The results of the residuals analysis are shown in Table 4.

Table 2. Reliability test one

		Sample Kolmogorov Smirnov Test				
		X	Y	Z	T	U
N		6413	6413	6413	6413	6413
Normal Parameters ^{a,b}	Mean	16.4032	3.8211	12.1904	3.9774	19.9796
	Std.Deviation	3.05566	.88586	2.29141	.82363	3.90108
Most extreme differences	Absolute	.176	.226	.203	.251	.179
	Positive	.137	.177	.177	.206	.155
	Negative	-.176	-.226	-.203	-.251	-.179
Test statistic		.176	.226	.203	.251	.179
Asymp.Sig.(2-tailed)		.000 ⁰	.000 ⁰	.000 ⁰	.000 ⁰	.000 ⁰

a. Test distribution is Normal; b. Calculated from data; c. Lilliefors Significance Correction

After analyzing the residuals to find out from the regression equation using the user-dependent variable (U) as the information in the previous calculation, the results are depicted in the form of a histogram graph. This graph illustrates the frequency distribution of the import value compared to the normal distribution graph where the number of samples (N) is 6,413 with a standard deviation of 1.00 and the mean value is 3.4 at an altitude of 2.7 as shown in Figure 2. while the normal regression graph is the normal P-P plot graph. This graph depicts the frequency distribution of the overall average import value according to the test distribution. Thus, the distribution of import values follows a normal distribution, as shown in Figure 3. The results of the linear regression analysis test reached 0.985, which has a significant correlation with a validity of 97%. It is expected that the large number of respondents can provide significant results for improving the quality of information systems.

Table 3. Regression test

		Correlations				
		U	X	Y	Z	T
Pearson correlation	U	1.000	.871	.778	.905	.897
	X	.871	1.000	.743	.892	.830
	Y	.778	.743	1.000	.777	.753
	Z	.905	.892	.777	1.000	.863
	T	.897	.830	.753	.863	1.000
Sig.(1-tailed)	U	.	.000	.000	.000	.000
	X	.000	.	.000	.000	.000
	Y	.000	.000	.	.000	.000
	Z	.000	.000	.000	.	.000
	T	.000	.000	.000	.000	.
N	U	6431	6431	6431	6431	6431
	X	6431	6431	6431	6431	6431
	Y	6431	6431	6431	6431	6431
	Z	6431	6431	6431	6431	6431
	T	6431	6431	6431	6431	6431

Table 4. Statistical analysis

Residuals Statistics ^a					
	Minimum	Maximum	Mean	Std.Deviation	N
Predicted value	2.0236	4.9536	3.9959	.73246	6413
Std.predicted value	-2.693	1.308	.000	1.000	6413
Standard error of predicted value	.004	.030	.007	.003	6413
Adjusted predicted value	2.0222	4.9542	3.9959	.73246	6413
Residual	-1.85665	1.66161	.00000	.26878	6413
Std.residual	-6.937	6.180	.000	1.000	6413
Stud.residual	-6.937	6.188	.000	1.001	6413
Deleted residual	-1.87376	1.66567	.00000	.26923	6413
Stud. deleted residual	-6.963	6.206	.000	1.001	6413
Mahal.distance	.249	77.083	3.999	5.481	6413
Cook's distance	.000	.089	.000	.002	6413
Centered leverage value	.000	.012	.001	.001	6413

a. Dependent Variable: U

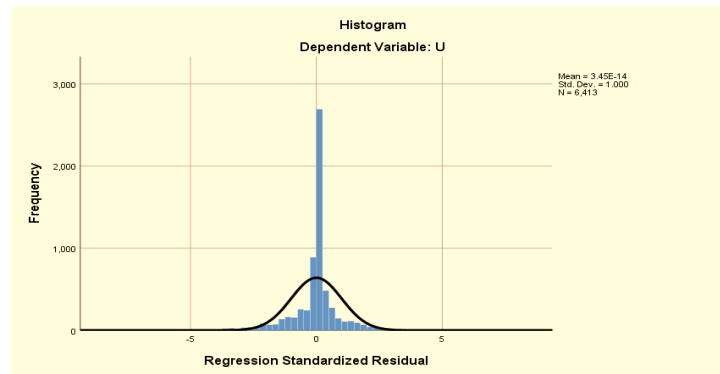


Figure 2. Regression graph

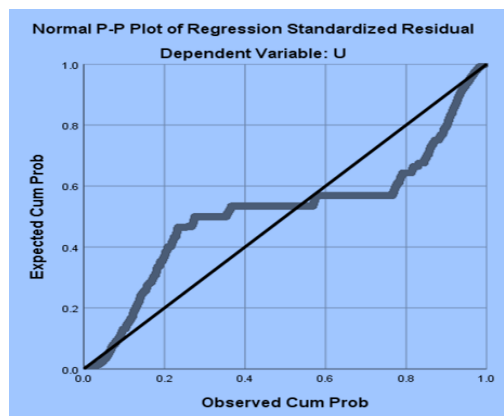


Figure 3. Graph of normal regression

4. CONCLUSION

The study found that the variables tangibles, reliability, responsiveness, assurance, and empathy had a significant effect on the acceptance of information system users' behavior on the Sunan e-learning website using the ServQual model with five dimensions. The quality of online learning services needs to pay attention to all aspects of the system according to user needs. E-learning is one of the innovations in information technology that provides information, knowledge, and convenience for students to learn flexibly. Acceptance evaluation is used as a benchmark for the development of e-learning system implementation in higher education.

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REFERENCES

- [1] A. Firwana, M. A. Shouqer, and M. Aqel, "Effectiveness of e-learning environments in developing skills for designing E-tivities based on Gamification for teachers of technology in Gaza," *Education in the Knowledge Society*, vol. 22, pp. 1–21, 2021, doi: 10.14201/EKS.23907.
- [2] J. Littenberg-Tobias and J. Reich, "Evaluating access, quality, and equity in online learning: A case study of a MOOC-based blended professional degree program," *Internet and Higher Education*, vol. 47, no. July, p. 100759, 2020, doi: 10.1016/j.iheduc.2020.100759.
- [3] M. W. Rodrigues, S. Isotani, and L. E. Zárate, "Educational data mining: A review of evaluation process in the e-learning," *Telematics and Informatics*, vol. 35, no. 6, pp. 1701–1717, 2018, doi: 10.1016/j.tele.2018.04.015.
- [4] Theresiawati, H. B. Seta, A. N. Hidayanto, and Z. Abidin, "Variables affecting e-learning services quality in Indonesian higher education: Students' perspectives," *Journal of Information Technology Education: Research*, vol. 19, pp. 259–286, 2020, doi: 10.28945/4489.
- [5] J. Chahal and N. Rani, "Exploring the acceptance for e-learning among higher education students in India: combining technology acceptance model with external variables," *Journal of Computing in Higher Education*, vol. 34, no. 3, pp. 844–867, 2022, doi: 10.1007/s12528-022-09327-0.
- [6] Y. Ozdemir, S. K. Kaya, and E. Turhan, "A scale to measure sustainable campus services in higher education: 'Sustainable Service Quality,'" *Journal of Cleaner Production*, vol. 245, p. 118839, 2020, doi: 10.1016/j.jclepro.2019.118839.
- [7] A. S. Al-Adwan, M. Nofal, H. Akram, N. A. Albelbisi, and M. Al-Okaily, "Towards a sustainable adoption of e-learning systems: the role of self-directed learning," *Journal of Information Technology Education: Research*, vol. 21, pp. 245–267, 2022, doi: 10.28945/4980.
- [8] S. Djelassi, M. F. Diallo, and S. Zielke, "How self-service technology experience evaluation affects waiting time and customer satisfaction? A moderated mediation model," *Decision Support Systems*, vol. 111, no. August 2017, pp. 38–47, 2018, doi: 10.1016/j.dss.2018.04.004.
- [9] M. M. Alam, N. Ahmad, Q. N. Naveed, A. Patel, M. Abohashrh, and M. A. Khaleel, "E-learning services to achieve sustainable learning and academic performance: An empirical study," *Sustainability (Switzerland)*, vol. 13, no. 5, pp. 1–20, 2021, doi: 10.3390/su13052653.
- [10] E. D. Sitanggang, Tulus, and B. B. Nasution, "Analysis of satisfaction level with servqual method using artificial neural networks," *Journal of Physics: Conference Series*, vol. 1235, no. 1, 2019, doi: 10.1088/1742-6596/1235/1/012061.
- [11] S. Altuntas, T. Dereli, and Z. Erdoğan, "Evaluation of service quality using servqual scale and machine learning algorithms: a case study in health care," *Kybernetes*, vol. 51, no. 2, pp. 846–875, 2022, doi: 10.1108/K-10-2020-0649.
- [12] D. Trivedi and A. Bhatt, "Quest for quality: Assessment of service quality of special academic institution library: case study," *Performance Measurement and Metrics*, vol. 21, no. 1, pp. 1–17, 2020, doi: 10.1108/PMM-02-2019-0004.
- [13] A. M. Al-Rahmi, W. M. Al-Rahmi, U. Alturki, A. Aldraiweesh, S. Almutairy, and A. S. Al-Adwan, "Acceptance of mobile technologies and M-learning by university students: An empirical investigation in higher education," *Education and Information Technologies*, vol. 27, no. 6, pp. 7805–7826, 2022, doi: 10.1007/s10639-022-10934-8.
- [14] S. Chatterjee, N. P. Rana, S. Khorana, P. Mikalef, and A. Sharma, "Assessing organizational users' intentions and behavior to AI Integrated CRM Systems: a Meta-UTAUT Approach," *Information Systems Frontiers*, no. 7491, 2021, doi: 10.1007/s10796-021-10181-1.
- [15] A. Alshehri, M. Rutter, and S. Smith, "The effects of utaut and usability qualities on students' use of learning management systems in Saudi tertiary education," *Journal of Information Technology Education: Research*, vol. 19, pp. 891–930, 2019, doi: 10.28945/4659.
- [16] P. Myeong-Jun and J.-K. Lee, "Investigation of college students' intention to accept online education services: an application of the UTAUT model in Korea," *Journal of Asian Finance*, vol. 8, no. 6, pp. 327–336, 2021, doi: 10.13106/jafeb.2021.vol8.no6.0327.
- [17] J. E. Raffaghelli, M. E. Rodríguez, A. E. Guerrero-Roldán, and D. Bañeres, "Applying the UTAUT model to explain the students' acceptance of an early warning system in higher education," *Computers and Education*, vol. 182, no. November 2021, 2022, doi: 10.1016/j.compedu.2022.104468.
- [18] S. K. Sharma, A. Gaur, V. Saddikuti, and A. Rastogi, "Structural equation model (SEM)-neural network (NN) model for predicting quality determinants of e-learning management systems," *Behaviour and Information Technology*, vol. 36, no. 10, pp. 1053–1066, 2017, doi: 10.1080/0144929X.2017.1340973.
- [19] K. K. Twum, D. Ofori, G. Keney, and B. Korang-Yeboah, "Using the UTAUT, personal innovativeness and perceived financial cost to examine student's intention to use E-learning," *Journal of Science and Technology Policy Management*, vol. 13, no. 3, pp. 713–737, 2022, doi: 10.1108/JSTPM-12-2020-0168.
- [20] A. A. A. Zwain, "Technological innovativeness and information quality as neoteric predictors of users' acceptance of learning management system: An expansion of UTAUT2," *Interactive Technology and Smart Education*, vol. 16, no. 3, pp. 239–254, 2019, doi: 10.1108/ITSE-09-2018-0065.




- [21] Y. J. Seo and K. H. Um, "The role of service quality in fostering different types of perceived value for student blended learning satisfaction," *Journal of Computing in Higher Education*, no. 0123456789, 2022, doi: 10.1007/s12528-022-09336-z.
- [22] N. Sitanggang, P. L. A. Luthan, and K. A. Hamid, "Relationship between total personal quality, service quality and student satisfaction on higher education system," *International Journal of Instruction*, vol. 14, no. 4, pp. 357–372, 2021, doi: 10.29333/iji.2021.14421a.
- [23] O. Prentkovskis, Ž. Erceg, Ž. Stević, I. Tanackov, M. Vasiljević, and M. Gavranović, "A new methodology for improving service quality measurement: Delphi-FUCOM-SERVQUAL model," *Symmetry*, vol. 10, no. 12, 2018, doi: 10.3390/sym10120757.
- [24] P. A. D. Mattah, A. J. Kwarteng, and J. Mensah, "Indicators of service quality and satisfaction among graduating students of a higher education institution (HEI) in Ghana," *Higher Education Evaluation and Development*, vol. 12, no. 1, pp. 36–52, 2018, doi: 10.1108/heed-10-2017-0006.
- [25] S. Rezaei *et al.*, "Evaluating service quality in the higher education sector in Iran: an examination of students' perspective," *International Journal of Human Rights in Healthcare*, vol. 10, no. 2, pp. 146–155, 2017, doi: 10.1108/IJHRH-12-2016-0024.
- [26] D. M. K. Nugraheni, A. Kusumawardani, B. Noranita, S. Adhy, N. Bahtiar, and R. Saputra, "Factors affecting student in accessing online tutorial with the technology acceptance model (TAM) (Study case: Commercial Tutorial On line in Indonesia)," in *2021 5th International Conference on Informatics and Computational Sciences (ICICoS)*, Nov. 2021, pp. 149–154, doi: 10.1109/icicos53627.2021.9651892.
- [27] M. B. Miles, A. M. Huberman, and J. Saldana, *Qualitative Data Anlysis: A Method Sourcebook*, vol. 59. Sage Publications, 2014.

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