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Analysis of Human Factors And Technology on Mobile-Based Academic Information Systems

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Abstract. The development of information systems technology has increased significantly in various fields. The education sector is also inseparable from the development of information system technology. One of them is the existence of a mobile-based academic information system that can be accessed by students from their respective smartphones. In its implementation, it is necessary to conduct an assessment of the information system from human factors and technology so that it develops even better. In this study, an assessment of human factors and technology will be carried out using the TAM method and the Is Success Model. The questionnaire was processed using SSSs and SmartPLs to assess the variables and models used. The results showed that the perception of Self Efficacy had a positive influence on Compatibility, Information Quality, Information Security, and System Quality. Information Quality also affects Ease of Use which also affects perceived usefulness. Perceived usefulness also affects the use and recommendations for using mobile-based academic information systems.

INTRODUCTION

Information systems and information technology are growing and increasing significantly in various fields. Evaluation of a learning support system is very important to determine the success of learning[12]. The utilization of information technology is not only in the business sector but also in the public sector, one of which is higher education institutions[5]. In order to provide services to students, academic information systems in tertiary institutions are important in improving the system and quality of academic services[14]. Implementation of a system that deals with acceptance and understanding of technology to increase awareness[7]. User acceptance is the main factor affecting the implementation of technology, so the factors determine who will support the implementation of the implementation[13]. Researchers are required to investigate the determinants of user acceptance, to improve application benefits, provide services to applications, face existing competition, and keep up with technological developments[2]. Application evaluation in terms of user acceptance is needed to determine the factors that affect user acceptance as a basis for making decisions on application development[9]. Acceptance and use of the mobile information system in higher education to investigate the use and acceptance of the Sakarya University Information system (SABIS). The results indicate a strong role for exogenous contexts and have a strong positive relationship between perceived convenience, perceived usefulness and trustworthiness[4]. A study on the use of the Technology Acceptance Model (TAM) which is integrated with the ISModel Success to find out how good the quality of the system and information is and the variables that reflect the suitability of the technology applied to its users[6]. The success of the DeLone and Mclean Information Systems used can help student satisfaction with the use of the Mri Rawas Academy System. The system of quality dimensions, information quality, and service dimensions affect student satisfaction at STMIK Musi Rawas. The variable that most influences student satisfaction at STMIK Musi Rawas is the variable service quality dimension factor with a loading factor of 66.3[8]. Analysis of the application of the academic administration system using the human organization technology suitability model. The data analysis technique used is SEM-PLS (Structural Equation Model-Partial Least Square) using the SmartPLS 3.0 application. The study used a questionnaire, determining the score for the statement items on the problem under study using a Likert scale 4. The results of this study indicate that the application of the SIMAK Instrument has not been successful, because, in HOT-Fit, the application of SIMAK at Abdurrab Pekan is only at the level of 40.2 % and fall into the weak or unsuccessful category[11]. Research on the analysis of human factors and technology that needs to be done to determine the success of the system and the factors that support the use and benefits so that users increase acceptance of the mobile-based academic system.

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RESEARCH & METHODS

This study integrates the TAM model and the IS Success model. Then the analysis was carried out using SPSS to determine the quality of the data. To find out the frequency distribution of the data, enter it using a spreadsheet application. In the model analysis process, SEM-PLS is carried out using SmartPLS so that it is known that the integration of the model is verified and knows the factors that affect the use of mobile-based academic information systems. From the SEM-PLS analysis, it is known the factors that influence the use of mobile-based academic information systems [6]. The data that has been obtained in this study can be briefly explained in the following attachment table 1.

TABLE I. Respondents Frequency Distributio

	Amount	Presentation	Total
Age			100
17-20	52	52%	
21-24	37	37%	
25-29	9	9%	
>=30	2	2%	
Gender			100
Male	55	55%	
Female	45	45%	
College Time			100
Employee Class	35	35%	
Reguler Class	65	65%	

In previous research conducted by Hidayah, it can be concluded that from 237 student respondents, it was found that 71.3% have used mobile applications to support their academic activities, 3.8% of students have not been able to accept mobile applications and 24.9% of students are still neutral and do not know about mobile applications to support their academic activities[3].

In this study, a survey was conducted and aimed at student respondents as users of a mobile-based academic information system application. The survey questions are divided into two parts, namely questions related to respondent information such as gender, age, and faculty. The next part of the question covers the respondent's assessment of the use of objects based on the method used. [1]. The questionnaire reference based on the literature study was used, then it was revised and adapted to the research needs. Testing of the questionnaire was carried out on several initial respondents to measure the level of semantic misunderstanding before it was distributed to respondents. The resulting questionnaire consisted of 28 items measuring 8 variables used.

DISCUSSION

Data Collection

Collecting data in this study using a random sampling technique using an online questionnaire to respondents who have used a mobile-based academic information system. Data collection was carried out for 1 week in January 2021 and obtained data of 100 respondents

Validity Test

The validity test is used to determine the feasibility of items in the questionnaire in defining a variable. The validity test uses Pearsons product-moment correlation to correlate the score of each statement item with the total score of the statement category. The data is said to be valid if the correlation coefficient is greater than the r-table value [14]. The r-table value is obtained based on the calculation results with a significance level of 0.05 is 0.1638. Following are the results of the validity of the test calculations carried out using SPSS.

TABLE II. Validity Test Result (Process Data Of Spss, 2021)

No	Point	R-Count	R-Table	Ref
1	PU1	0,858	0,1638	Valid
2	PU2	0,875	0,1638	Valid
3	PU3	0,845	0,1638	Valid
4	PU4	0,901	0,1638	Valid
5	ETU6	0,818	0,1638	Valid
6	ETU7	0,821	0,1638	Valid
7	ETU8	0,872	0,1638	Valid
8	ETU9	0,843	0,1638	Valid
9	SE11	0,846	0,1638	Valid
10	SE12	0,868	0,1638	Valid
11	SE13	0,836	0,1638	Valid
12	IQ15	0,774	0,1638	Valid
13	IQ16	0,767	0,1638	Valid
14	IQ17	0,835	0,1638	Valid
15	IQ18	0,796	0,1638	Valid
16	CWP20	0,842	0,1638	Valid
17	CWP21	0,885	0,1638	Valid
18	CWP22	0,812	0,1638	Valid
19	IS24	0,83	0,1638	Valid
20	IS25	0,891	0,1638	Valid
21	IS26	0,882	0,1638	Valid
22	IS27	0,874	0,1638	Valid
23	SQ29	0,907	0,1638	Valid
24	SQ30	0,886	0,1638	Valid
25	SQ31	0,848	0,1638	Valid
26	SQ32	0,85	0,1638	Valid
27	Y34	0,909	0,1638	Valid
28	Y35	0,92	0,1638	Valid

In Table 2, it is known that the questionnaire was tested valid so that the processing process can be carried out with 28 questions which are divided into 8 variables.

Realiability Test

After the validity test was carried out, this study also conducted a reliability test to find out whether the research variables used had reliable measuring instruments for all respondents. The reliability test was carried out by calculating the Cronbach alpha value.

TABLE III. Realiability Test Result (Process Data Of Spss, 2021)

Research Variable	Cronbach's Alpha
Description of Usefulness of M-Student	0,834
Ease of Use of M-Student	0,826
Self-Efficacy of the M-Student Application	0,845
The quality of information generated by the M-Student Application	0,813
Compatibility of the M-Student Application to the Academic Process	0,845
Confidentiality of M-Student Application Information	0,834
M-Student Quality System	0,834
System usage response	0,901

Based on Table 3, it can be seen that the results of the reliability test carried out on each research variable have reliable results as a whole because it has a Cronbach's alpha coefficient value of more than 0.7 [11].

Frequency Distribution

The questionnaire was carried out by random users via an online questionnaire. Respondents are students who have used a mobile-based academic information system. In this study, in addition to questions related to factors that influence the use of information systems, respondents were also asked about their demographic data. Based on the data collected, here are the demographics of the respondents based on gender, education level, age, and profession. Table 1 shows the results of the frequency distribution of the 100 respondents who filled out the questionnaire

Research Result

Hypothesis testing is done to see whether the hypothesis made based on the conceptual research model is accepted or accepted. Hypothesis testing in this study is to see the path coefficient value generated through the bootstrapping process in the structural model. The hypothesis is accepted if it has a positive loading factor value and the t-statistic value is greater than the t table value.

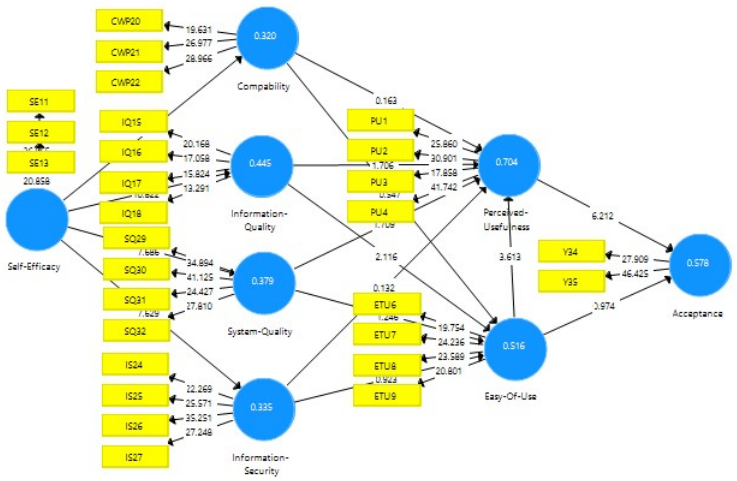

FIGURE 1. Bootstrapping

TABLE IV. Hypothesis Test (Processed Data of Smartpls, 2021)

No	Hypotesis	T-Statistic	T-Table	Result	No	Hypotesis	T-Statistic	T-Table	Result
1	SE->C"	7,689	1,986	accepted	9	SQ->PU"	1,772	1,986	rejected
2	SE->IQ"	9,948	1,986	accepted	10	SQ->EOU"	1,182	1,986	rejected
3	SE->SQ"	8,197	1,986	accepted	11	IS->PU"	0,130	1,986	rejected
4	SE->IS"	8,010	1,986	accepted	12	IS->EOU"	0,992	1,986	rejected
5	C->PU"	0,162	1,986	rejected	13	EOU->PU"	3,679	1,986	accepted
6	C->EOU"	0,587	1,986	rejected					
7	IQ->PU"	1,749	1,986	rejected	15	EOU->Y"	0,978	1,986	rejected
8	IQ->EOU"	2,197	1,986	accepted					

From Table 4 it is known that testing obtained 15 hypotheses. After analyzing the data, of the 15 hypotheses proposed in the model evaluation, 7 were accepted and 8 were rejected. The results of hypothesis testing on analysis The results of proving the hypothesis on the analysis of the relationship between variables (Table 4) show the findings of this study where the perception of Self Efficacy has a positive effect on Compatibility, Information Quality, Information Security, and System Quality. The quality of information also affects the Ease of Use which also affects

the perceived benefits. Perceived usefulness also influences usage and recommendations for using the system. The test results also show that compatibility has no effect on ease of use and perceived usefulness, information security also has no effect on ease of use and perceived usefulness. Likewise, the quality of the system has no effect on the perceived ease of use and usefulness. The perceived quality of information does not affect the usability and ease of use as well as recommendations for system use.

CONCLUSION

Based on the results of the analysis on the research that has been conducted, it can't be denied that the factors that influence students to use mobile-based academic information systems are self-efficacy towards suitability, information quality, system quality, information security. This condition provides support for the relationship of information quality to usage which affects perceived usefulness so that it has an influence on the influence of use and recommendations on system use

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