

Analysis Use of Academic Information System by Undiksha New Student

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Abstract—The objectives of the research are to predict and explain use of Academic Information System (SIAk) by Undiksha new students with TAM as the basic of theory. Researcher used pick up survey and collected 271 Undiksha new students as respondents processed it by Partial Least Squares (PLS). The results show that perceived ease of use, perceived usefulness, attitudes, subjective norms, are determinants of behavior intention and actual use. Perceived ease of use be main determinant in this study. In addition, TAM which was added by subjective norms construct was proven to be able to predict and explain use of behavior which is considered as mandatory behavior.

Keywords—Perceived Ease of Use; Perceived Usefulness; Attitudes; Subjective Norms; Behavioral Intentions; Actual Use; TAM

I. INTRODUCTION

Universitas Pendidikan Ganesha (Undiksha) is one of the goals of senior high school (SMA) and vocational high school (SMK) graduates both from Bali and outside of Bali to continue their education to university. This resulted Undiksha becoming one of the biggest university in Bali because of increasing number of new students at Undiksha. Total 2,868 people, number of Undiksha new students for 2017/2018 from various entry points. After being registered as a student, the new students must adapted university culture by increase their independence in all their activities.

Because of that, new students must be active and orderly in all activities, both academic and non-academic activities. In non-academic campus activities, Undiksha provides freedom and independence for the individual new students themselves

to carry out their activities. However, for academic activities, Undiksha has standard operating procedures that are adjusted to the rules of the Directorate General of Higher Education under the Ministry of Research, Technology and Higher Education. Therefore, it must be regulated in the form of an administrative management that is arranged procedurally, systematically, effectively, efficiently, sustainably, structured and accountable. The academic administration is started when prospective students re-register to become new Undiksha students, in accordance with the chosen department until they are declared permitted to join Undiksha academic system.

When re-registering as a student, candidate will begin to fill in the biodata until a personal data is created, about the student, and then candidates has a Student Identity Card (KTM) and is declared a Undiksha new student. Followed by filling out the Study Plan Card (KRS) and later will have a Study Result Card (KHS) at the end of the college semester. All of these things are regulated in an administrative system about academics called the Information Academic System (SIAk) which is used specifically for the Undiksha academic administration process.

Because the number of new student admissions is so large, SIAk must be systematic and integrated, so that Undiksha can manage, serve, supervise, control and report on new student academic activities. If there is no systematic and integrated SIAk then all academic activities become uncontrolled and academic data becomes irresponsible. Systematic means that there are parts that are involved and integrated, meaning that the parts cannot be run individually because they have relationships and ties. Therefore technology is needed to run SIAk, then it is easier to systematize and integrate [1], [2].

The parts in the SIAk Undiksha such as the Technical Implementation Unit - Information and Computer Technology (UPT-TIK, formerly called the Puskom), Academic Bureau of Planning and Information System Student Affairs (BAKPSI) and 1st Vice Rector, Academics Department in Faculties, 1st Vice Dean must have a systematic and integrated relationship of academic data. The technology function causes UPT-TIK as a data bank, BAKPSI as a data source and the Faculty as data users causing the parts of SIAk to be integrated with each other. With the existence of technology, namely information technology, the Undiksha will be easier in deciding all its activities [3] included in academic activities, so that SIAk can be realized in a systematic and integrated. Successful organization because of its ability to manage information [4], Undiksha is successful in managing its academic activities that produce academic information because of technological investments in its academic system. At present, Undiksha already has and uses Academic Information System (SIAk) base on technology.

With the existence of technology on SIAk, Undiksha has an academic management system that is fast, precise, effective and efficient, so that students can be served in academic terms well. Moreover, SIAk based on technology used by Undiksha has been based online which has been systematic and integrated [5], [6]. SIAk based on technology has been able to coordinate and mobilize elements related to academics, monitoring academic activities, manage academic elements, assist academic decisions, and facilitate communication and cooperation of the elements that carry out academic activities at Undiksha. In addition, with the existence SIAk based on technology, Undiksha will be able to (1) reduce the costs of preparation, processing and reporting of academic data; (2) saving the cost of distributing student data from bank data to data users; (3) increasing the speed in student data access [1].

New students as one of the consumers who consume information from technology-based SIAk must inevitably use the system to carry out their academic activities. When using the SIAk based on technology, student data will be stored in the Undiksha data storage center and certain parties can access the information. However, it is necessary to know that new students in high school and vocational high school level have the existence of technology in academic schools system. For schools that have advanced financial support and facilities and infrastructure will certainly produce graduates who have different desires and actions than graduates from schools that do not have technology in their academic school system.

This is will have an effect when new students use SIAk based on technology has been implemented at Undiksha. Behavioral intentions and actual use of technology are determinant in using a technology including SIAk based on technology [7], [8]. Behavioral intention is the main determinant in measuring the behavior of technology use [9],

[10]. Based on the phenomena that exist and reference the previous research, the researcher assumes the desires or behavioral intentions and real actions or usage behaviors to be determinants in using a technology including SIAk based on technology by new students, so that the research focus is on behavioral intentions and actual use behaviors of using SIAk based on technology by Undiksha new student.

The researcher also assumes that Undiksha new students using SIAk based on technology, the researcher uses Theory of Technology Acceptance Model (TAM) in this study. The use of TAM in this study is because, *first*, TAM is a theory of acceptance information technology that considers psychological factors. *Second*, TAM is a simple but valid model. *Third*, TAM is a model of acceptance information systems based on technology that will be used by technology users [11].

Based on the research focus, this research is very important to do because, *first*, Undiksha is currently using SIAk based on technology, but there are different student input from each of the high schools and vocational high schools throughout Bali where the school conditions are different then the Undiksha needs to know things that can affect the determinan behavior intentions and actual use of using SIAk based on technology, especially by Undiksha new students. *Second*, this study uses TAM which has been used for the acceptance information systems based on technology for individuals in business or business organizations such as banking, service companies, hospitality or government [12]–[15]. Researchers want to test TAM in university with individual users information systems based on technology are new students with the system used is Academic Information System (SIAk) based on technology at Undiksha.

However, the TAM model only provides very general information or results about behavioral intentions and actual use in acceptance information systems based on technology [11]. In addition, the validity of the theory and empirical applicability of TAM still need to be developed in differences technology, users and organizational context [16]. Therefore, researchers argue that it is necessary to add other variables to better predict and explain the behavioral intentions and actual use of system by users in using information systems based on technology. Researchers extended Subjective Norms construct because subjective norms are individual references that can influence an individual's motivation for behavior [17] including using SIAk based on technology in this case lecturers, student friends, department managers and academic staff.

The aim of the study was to analyze and explain the effects of extrinsic factors (perceived ease of use and perceived usefulness) and intrinsic factors (perceived playfulness), such as attitudes, behavioral intentions and actual use of using wi-fi

II. LITERATURE REVIEW

A. *Technology Acceptance Model (TAM)*

One theory of technology acceptance is the Technology Acceptance Model (TAM). Fred D. Davis introduced the theory of TAM for the first time in 1986, where this theory was developed from the Theory of Reasoned Action (TRA) to provide an explanation of the behavior of information systems users. TAM is the most influential model and is widely used to explain the acceptance and use of information systems by individuals. The TAM model is a very valid model that is used to predict and explain behavior in the acceptance of new technology by users [18].

There are five main constructs in TAM, namely perceived usefulness, perceived ease of use, attitudes towards behavior, behavioral intention to use and actual use of technology (actual technology use) However, the construct of perceived usefulness and constructs of perceived ease of use are the two main constructs in the TAM model [11], [19]–[21] and both constructs have an influence on behavioral intentions [22]–[26] as well as important predictors than any other construct.

B. *Research Hypothesis*

The perceived ease of use is the level of one's belief in using a particular system so that it will facilitate their work [19]. The construct of perceived ease of use is explained through the TAM model and the development of other TAM models where this construct is not directly related to the construct of behavioral intention but through mediation of attitude constructs. The constructive indicators of perceived ease of use are (1) Absence of difficulties, (2) Easy, (3) Interactions that are easy to understand [18].

- H1: Construct Perceived Ease of Use has a positive effect on construct Perceived Usefulness of using SIAk based on technology by Undiksha new students
- H2: Construct Perceived Ease of Use has a positive effect on construct Attitude of using SIAk based on technology by Undiksha new students
- H3: Construct Perceived Ease of Use has a positive effect on construct Behavioral Intention of using SIAk based on technology by Undiksha new students
- H4: Construct Perceived Ease of Use has a positive effect on construct Actual Use of using SIAk based on technology by Undiksha new students

Perceived usefulness as the level of one's belief that using a particular system will improve performance [27]. In this study, perceived usefulness is defined as how far the level of

confidence of new students in using SIAk based on technology is implemented at Undiksha. The construct indicators of perceived usefulness used are (1) Faster administration, (2) College achievement; (3) Increasing productivity, (4) Increasing effectiveness, (5) Making work easier [18].

- H5: Construct Perceived Usefulness has a positive effect on construct Attitude of using SIAk based on technology by Undiksha new students
- H6: Construct Perceived Usefulness has a positive effect on construct Behavioral Intention of using SIAk based on technology by Undiksha new students
- H7: Construct Perceived Usefulness has a positive effect on construct Actual Use of using SIAk based on technology by Undiksha new students

Attitudes are affections that someone feels are measured by a procedure, which places individuals on two different sides such as accepting or rejecting an object [17]. In the context of this research, individual attitudes are based on technology is how far new students show from within, to accept or reject a SIAk based on technology is implemented at Undiksha. The attitude construct indicators used are: (1) Good ideas; (2) Fun; and (3) Useful [28].

- H8: Construct Attitude has a positive effect on construct Behavioral Intention of using SIAk based on technology by Undiksha new students

Subjective norms are determined by the dual function of a person's normative beliefs, are perceived expectations of a specific reference to an individual or group and their motivation to fulfill their expectations [17]. Subjective norms in this study are expectations of trust and motivation given by others to new students, which can affect new students to use the SIAk based on technology is implemented at Undiksha. This study uses indicators (1) Advice from lecturers; (2) Advice from classmates; (3) Advice from staff of academic staff; (4) Department manager's recommendations [8].

Researchers in this study do not relate subjective norm constructs to attitude constructs. This is because the attitude construct is an intrinsic variable while the subjective norm construct is an extrinsic variable [29]. This research model only connects subjective norm constructs to construct behavioral intentions directly and relates to constructs actual use through mediating constructs of behavioral intentions. Because, *first*, subjective norms will first result in the emergence of desires, before carrying out an actual action or behavior [29] and subjective norms are less important in technology acceptance [30].

Second, research on the relationship of subjective norms and usage behavior stated that subjective norms will have an impact on actual use, if there is an indication of the role of the internalization process as a structured part of convincing respondents (Venkatesh and Davis, 2000). Internalization is the process of combining the beliefs and suggestions of others to use a system. Internalization is a large process and requires a long period of time on individual performance, to use the system, so that subjective norms are less predictors of the behavior of information systems.

H9: Construct Subjective Norms has a positive effect on construct Behavioral Intention of using SIAk based on technology by Undiksha new studentss

Behavioral intention is a person's desire to do a certain behavior [11]. The intention of behavior in this study is a desire of new students to want to and use the SIAk based on technology is implemented at Undiksha. Indicators and question items construct behavioral intention from other research, (1) Continuing to Use the System; (2) Expectations in Using the System; (3) Recommend the System [18].

Behavior is a real action or activity carried out [11]. The usage behavior in this study is a real action from new students to use the SIAk based on technology is implemented at Undiksha. Indicators and items of question constructs of use behavior, (1) Frequency of use; (2) When to use [31].

H10: Construct Behavioral Intention has a positive effect on construct Actual Use of using SIAk based on technology by Undiksha new students

III. RESEARCH METHOD

This study is quantitative research with statistics as an analytical tool. This research began with preliminary observations in the Bureau of Academic, Student, Planning and Information Systems (BAKPSI) in Undiksha find out the phenomenon of problems in the use of the Academic Information System (SIAk) by Undiksha new students. New students who often use information systems based on technology sometimes get into trouble, often there are doubts, and there is still confusion over the use of SIAk based on technology so that the information to be conveyed or obtained is less than optimal. In this study, this activity is the first stage. At this stage, it will be decided how the advanced research and planning design, especially for the number of new students who are respondents, data collection techniques, analytical tools used, pilot test design and actual tests, the results of analysis and discussion, and the results that can be utilized by interested parties .

In this first stage the researcher decided that for data collection researchers used survey methods to obtain certain data, especially to obtain individual opinion data [32] and data

collection methods suitable for a large number of respondents [33]. The survey used in this study is a pick up survey.

However, even though the researcher knows the population of Undiksha new student data collection techniques using purposive sampling technique is used to determine the sample [33]. It was decided by the researcher that the criteria used as the category of respondents in this study were respondents who were new students such as (1) registered and active from 2017/2018; (2) have a Student Identification Number (NIM), User Name, and Password and have used SIAk based on technology; (3) students who in the first semester and second semester have already used and received information from SIAk based on technology is implemented by Undiksha.

At this stage the researcher also decided that the analysis tool used Partial Least Square (PLS). The researcher also designed this study with full of hypothesis because in accordance with the purpose of the second study to determine the validity of constructs in TAM, where the results of PLS can be used to interpret this [34]. Therefore researchers need a large sample of around 300 Undiksha new students in 2017/2018 in all programs in all faculties at Undiksha so that they require a large enough questionnaire so that the results of the study will better represent the use of SIAk based on technology by new students.

At second stage, the researcher conducted a theoretical study by adjusting the theory of technology acceptance and technology usage behavior for Undiksha's new students in using SIAk based on technology. The researcher believes that the use of SIAk based on technology is a mandatory behavior, this study uses the Technology Acceptance Model (TAM). In the third stage, researchers conduct the initial implementation stage by submitting a permit and a request for data on the number of new students to the Bureau of Academic, Student, Planning and Information Systems (BAKPSI) to implement research in all programs in all Undiksha faculties and the Postgraduate Program. The next stage is data collection. However, before the data collection phase for real respondents, researchers covered pilot tests. The fourth stage, sending the questionnaire to the pilot test, taken by 50 students in the Accounting Department both the Diploma III Program and the S1 program, where 50 students who have been sampled in the pilot test will not be sampled in the actual test or research.

Fifth, the stage of taking questionnaires to subjects who were respondents to the pilot test. Sixth, the instrument validity test phase by looking at the Outer loading and AVE and the reliability of the instrument by looking at Composite Reliability and Cronboach Alpha. Seventh, the stage of sending questionnaires to the subjects who were the real respondents. The researcher will distribute 300 questionnaires

with the aim of increasing the generalization of the research results and anticipating the response rate of the samples that are the subjects of the study. Eighth, researchers will process research data using PLS. The results of the study will be described using SIAk based on by new students be implemented by Undiksha.

IV. RESULTS AND DISCUSSION

A. Model Testing

Before conducting a hypothesis test, the researcher first evaluates the model by testing the validity and reliability of the construct. The results can be seen in the table that the AVE value and Commuality of each construct is greater than 0.5, which means that each indicator in each construct is a measure of each construct and a measuring indicator for each construct

for the construct different are not mutually correlated or constructs already have convergent validity and discussion validity. In the table it can also be seen that the Composite Reliability and Cronbach Alpha values are more than 0.6, which means that the indicators of the constructs used in this study have accuracy, error-free and consistency.

Table 1 show2 R2 value table means formulation of Goodness of Fit (GOF) to measure the inner model and it can be concluded that the relationship between constructs in the model is able to predict behavioral intentions and actual use. Then the researcher conducted a hypothesis test (H) 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 where based on the bootstrapping process the t-statistic value above was 1.645 with a significance level of five percent (5%) and all values the coefficient is positive then all hypotheses are accepted.

TABLE 1. RESULT OF OUTPUT OVERVIEW OF ALGORITHMS

	AVE	Commuality	Cronboach Alpha	Composite Reliability	R Square
Perceived Ease of Use	0.792	0.871	0.868	0.919	
Perceived Usefulness	0.622	0.880	0.878	0.908	0.529
Attitude	0.690	0.779	0.776	0.870	0.543
Subjective Norms	0.640	0.821	0.812	0.876	
Behavioral Intention	0.708	0.800	0.791	0.878	0.622
Actual Use	0.622	0.754	0.743	0.854	0.549

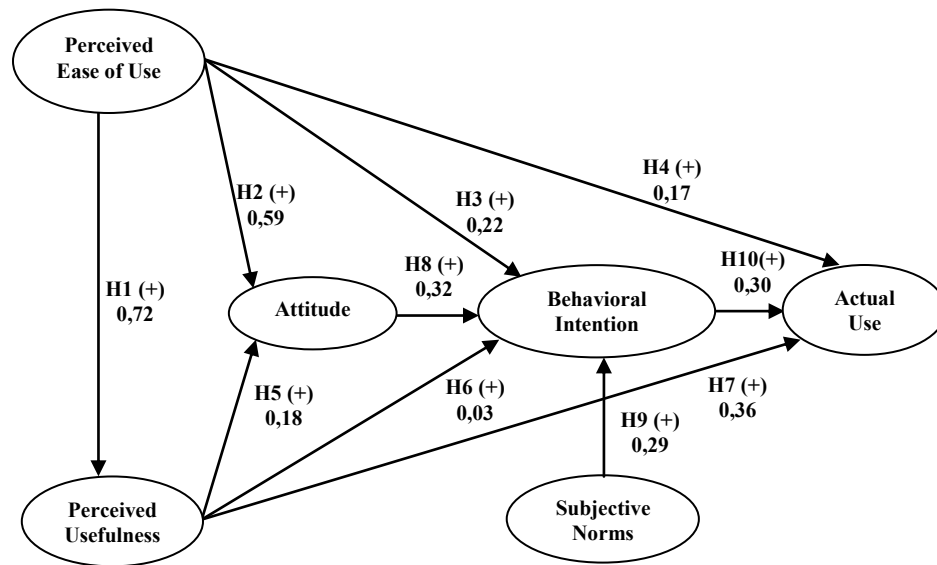


Fig. 1. Hypothesized Model

B. Discussion

1) Perceived Ease of Use, Perceived Usefulness, Attitude, Behavioral Intention, and Actual Use

The Undiksha new students believe that they want to use a Academic Information System based on technology using the system they have no difficulties, are easy to use and do not

find obstacles such as complexity. The Academic Information System is easy, not difficult and uncomplicated, of course, will give confidence to individuals to accept the system, of course this will bring up their desires and real act to always use the academic information system. This means that they use, accept, desire and use the system to complete academic

activities because the Academic Information System is implemented at Undiksha is not difficult, easy and uncomplicated so that the construct of Perceived Ease of Use has a positive effect on the construct of Perceived Usefulness, Attitude construct, construct Behavioral Intention and construct of Actual Use and this construct are the main determinants in this research model. This is consistent with other researches [19], [35]–[38].

2) *Perceived Usefulness, Attitude, Behavioral Intention, Actual Use*

The results showed that the construct of Perceived Usefulness had a positive effect on Attitude, Behavioral Intention and Actual Use. This means that new students believe that using the Academic Information System will speed up the administrative process, making it easier to obtain information, it can improve college achievement, be productive and effective in carrying out academic activities. This belief will increase student acceptance of this system and will always bring out the real wishes and actions of students in using academic information systems based on technology. This result is consistent with other studies [19], [35]–[38].

3) *Attitude and Behavioral Intention*

The Undiksha new student believes that using a Academic Information System based on technology is a good idea, something that is fun and something that is beneficial in carrying out campus academic activities, so that, the attitude construct has a positive effect on the construct of behavioral intention. The researcher stated that the affection of accepting the system from Undiksha new students greatly influenced his desire to use academic information systems based on technology to complete all academic activities. The results of this study are consistent with others [8], [19], [28], [39], [40].

4) *Subjective Norms and Behavioral Intention*

In using a Academic Information System based on technology lecturers, classmates, academic staff and department managers also contribute to the influence of the wishes of the Undiksha students to use the system, so that the Subjective Norm construct influences the construct of behavioral intention. The results of this study are consistent with the results of other studies [8], [41], [42]. However, other results are not the same because external parties only offer advice but not pressure [14]. However, in this study, researchers found different results that the suggestion given by lecturers, classmates, academic staffs and department managers encouraged and increased the confidence of new students to use the system. This means that, in the context of system acceptance behavior by individuals in the university environment, where the construct of subjective norms added to the TAM model can predict and explain the context of mandatory behavior in the use of the system.

5) *Behavioral Intention and Actual Use*

The Behavioral Intention construct has a positive effect on the Actual Use construct, meaning that Undiksha new students want to use a Academic Information System based on technology because of the motivation to continue using the system, the expectation of using the system and of course recommending the system to their peers while carrying out academic administration. The motivation is shown from the time and frequency of the use of Undiksha new student using academic information system based on technology to support their activities. The results of this study are consistent with other studies [7], [8], [10], [19].

V. CONCLUSION

The use of the TAM model which constructs have been added has shown that, first, the construct of the Perceived Ease of Use and construct of Perceived Usefulness are determinants of the Attitude, Behavioral Intention, and Actual Use constructs. Subjective Norms construct is a determinant of the construct of Behavioral Intention. This means that these constructs are able to predict and explain the behavioral intentions and actual use of Undiksha new students in using SIAk based on technology has implemented at Undiksha. However, this study only added the Subejective Norms construct. The next study is to use constructs on other acceptance models that can be added to the TAM model so that they are more known for the mandatory behaviour of information systems based on technology, because the constructs in the TAM model are very suitable to be used to predict and explain mandatory behaviors.

Second, the construct of Perceived Ease of Use becomes the main determinant in the TAM model whose construct is added to the Subjective Norms construct. This means that if a system including a SIAk based on technology that is implemented is not difficult, easy and uncomplicated, of course it will increase affection to accept, desire and real action in using the system. The results of the study also show that Subjective Norm construct is more influential which affects the desires of Undiksha new students in using SIAk based on technology. Even though the system is not difficult, easy and uncomplicated, because the background of each individual is different and new students must use the system, the recommendations from other parties also influence to use of SIAk based on technology has implemented at Undiksha. For further research, it can compare model acceptance use of SIAk based on technology in research models that add and do not add Subjective Norms constructs to see the influence of external parties.

Third, the relationship of constructs in TAM shows good path coefficients, TAM is a good, robust research model to be tested even in different research domains. Constructs of Perceived Ease of Use and constructs of Perceived Usefulness are the main constructs in TAM. However, the dominance of the two constructs depends on the subject and object of the

study. In this study, for Undiksha new students who are implemented SIAk based on technology must not be difficult, easy and uncomplicated. The usefulness of the system for the academic process is not a concern. Their focus is getting information and entering important data is not difficult, easy and uncomplicated. Therefore it is necessary to do research again at other universities and the results can be compared to evaluate Academic Information System based on technology has implemented each of university.

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