

An Analysis of Technology Acceptance Model with Extensions in Affective Components and Anxiety for Village Financial System (Siskeudes)

A Case Study in Tangerang District, Indonesia

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ABSTRACT

The purpose of this study is to measure the predictors affecting the acceptance of a new system, Siskeudes, intended to assist villages to administer village fund. It was designed by State Development Audit Agency (BPKP) to be applied in Indonesian villages in 2016. Technology Acceptance Model (TAM) used in this research consisted of Perceived of Usefulness (PU) and Perceived Ease of Use (PEU) as direct variables affecting Intention of Use (IU). In addition, two extensions were added to the model; Computer Anxiety (ANX) and Affect (AFF). From 246 questionnaires distributed to all Siskeudes operators in all villages in Tangerang District, 187 were fit for research purpose. To describe the relationship pattern between latent constructs and observed variables, Structural Equation Modelling (SEM) was used. The significant findings showed that the technology anxiety of operators influenced their perceptions on the usefulness of Siskeudes negatively, whereas operators' positive perception on Siskeudes influenced their perception on Siskeudes ease of use positively. Furthermore, both Siskeudes usefulness and ease of use affected their intention to use positively. Likewise, PEU affected PU positively. One implication of the findings is that gratifying work environments are needed to enhance Computer Affect (AFF). Minimizing Anxiety (ANX) through intensive training for operators is another significance of the findings.

Type of Paper: Empirical

Keywords: Siskeudes; TAM; Anxiety; Affect

1. Introduction

The Revised State Budget 2015 accommodated the budget for villages for about 3 percent from total budget transferred for regional government (Government Regulation (PP) number 60/2014 jo PP 22/2015). Due to the significant amount of budget, 20,8 trillion rupiahs, transferred to villages across Indonesia, the accountability and transparency problems predicted by Anti-Corruption Commission (KPK) through its financial report recommendation for State Development Audit Agency (BPKP) and Ministry of Home Affairs (Kemendagri) should be anticipated by creating Village Financial System (KPK, 2015).

Therefore, memorandum of understanding between BPKP and Kemendagri, MoU-16/K/D4/2015, was designed to ensure the implementation of Good Village Governance focusing on the way that a village administrative can manage its budget accountably from planning, implementation, administration, reporting, and controlling (Novianto, 2016). Based on the MoU and Ministry of Home Affair Regulation number 113, 2014, BPKP designed a standalone application called Siskeudes that was launched on July 13, 2015.

Siskeudes is a Microsoft Access-based application enabling Villages to create financial outputs such as Village Medium-Term Development Plan (RPJM), Village Government Work Plan (RKP), Village Budget Implementation Report, Village Asset Report, and Compilation Report (Novianto, 2016). The aim of the application is to assist Village administrations to create financial reports and administrations easier.

Previous research of user acceptance confirmed that computer proficiency is an important factor influencing the user's intention to use the system (Gary et al., 2003). In line research also found that attitude towards system is prominently affected by several components, two of them are computer anxiety and computer liking (Al Khaldi & Al Jabri, 1997). Computer Anxiety (ANX) refers to fear when user use certain computer system or application. Prior studies show that computer anxiety may emerge when dealing with computer system, mainly when firstly interacting with the system (Gary et al., 2003). Meanwhile, Computer Affect (AFF) refers to the feeling related to the level of computer is liked (Saade & Kira, 2006).

In the last few decades, several theories have been developed to explain technology acceptance and its implementation. One of the model proposed by Davis, Technology Acceptance Model (TAM), became a foremost model in examining variables influencing users' acceptance of the new technology (Nikola & Andrina, 2014). The TAM assumes the contribution of two variables, Perceived Ease of Use (PEU) and Perceived of Usefulness (PU), to predict latent system implementation (Nikola & Andrina, 2014). Perceived Ease of Use (PEU) can be defined as users' perception that the implementation of the technology will be effortless. Meanwhile, Perceived of Useful (PU) refers to users' perception that by implementing the system, the users can enhance their job performance (Davis, 1989).

Investigation of Siskeudes' user acceptance by examining its factors, Perceived of Useful (PU) and Perceived Ease of Use (PEU), and by exploring its extensions, Computer Anxiety (ANX) and Computer Affect (AFF), need to be performed to acquire information on what factors determine the most and how to increase the user' intention to use the system. The purpose of this study is to measure the factors influencing the acceptance of the users related to a new system implemented in all over Indonesian villages, Siskeudes by means of the established model conducted by Davis (1989, 1993, and 1996) and Saade & Kira (2006).

2. Literature Review

2.1. Technology Acceptance Model (TAM)

TAM was first designed to assess the prospective of the IBM's market for its PC's based applications in the mid-1980s (Davis, 1989; Davis, 1993; Davis & Venkatesh, 1996). It was developed to comprehend the association of external stimulus to its user acceptance and actual use in a workplace. External stimulus consists of two variables, perceived usefulness (PU) and perceived ease of use (PEU) (Davis, 1989).

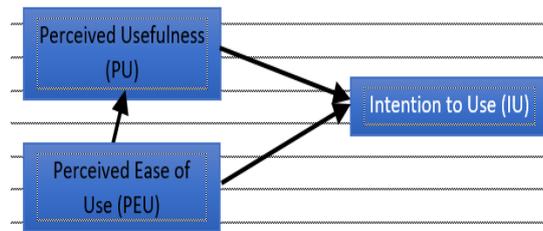


Figure 1. Technology Acceptance Model (Davis & Venkatesh, 1996)

2.2. Perceived Usefulness (PU)

Perceived usefulness is described as “the degree to which a user believes that using certain system would increase his or her job productivity.” Based on organizational perspective, people are generally motivated for high performance by providing increased compensations, incentives, upgrades, and other rewards (Pfeffer, 1982; Schein, 1980; Vroom, 1964). The high perceived usefulness system will be accepted positively by the user because of the positive belief he/she has that the system used will enhance his or her working performance. Accordingly, the first hypothesis is as follows:

Hypothesis 1: Perceived Usefulness is related to Intention to Use of Siskeudes Users

2.3. Perceived Ease of Use (PEU)

On the contrary, perceived ease of use is related to “the users’ degree of beliefs that by means of a certain system, they would require less effort to operate.” This comes from the meaning of “ease”, which is autonomy from difficulty or countless effort (Davis, 1989). According to Radner & Rothschild (1975), effort is a reserve that a person may assign to the numerous accomplishments for which he or she is in charge. The easier the operations of a system, the higher the acceptance by the user (Davis, 1989). Furthermore, perceived ease of use has a causal effect with perceived of usefulness (Davis, 1993). Therefore, the second and third hypotheses are made as follows:

Hypothesis 2: Perceived Ease of Use is connected with Intention to Use of Siskeudes Users

Hypothesis 3: Perceived Ease of Use is related to Perceived Usefulness

2.4. Intention to Use (IU)

Instead of using attitude as a variable in the first model of TAM, Davis & Venkatesh (1996) proposed the updated TAM that uses behavioral intention or intention to use as replacement. They suggested that the attitude did not fully mediate variables perceived usefulness and perceived ease of use. Nevertheless, the use of intention to use in the latter TAM model obviously depicts the direct influence of perceived usefulness and perceived of use.

In this study, the researchers decided to use the revised model of TAM that differentiates this study with what have completed by Saade & Kira (2006). According to Davis & Venkatesh(1996), intention to use (IU) can be measured by users’ attitude concerning adopting new system that is determined by both perceived ease of use (PEU) and perceived usefulness (PU). In addition, Intention to Use is the most significant variable predicting actual usage of system. The revised TAM model can be described in Figure 1.

2.5. *Affect (AFF)*

Affect is one of extensions adapted from Saade & Kira (2006) to more depict what factors correlate to perceived usefulness and perceived ease of use. Lee et.al. (2003), found that there are various researches related with extensions of TAM, however, affect positively correlates with the behavior strongly (Triandis, 1980).

Cognitive, affective, behavioral, and perceived control are four dimensions of the term affect. The cognitive component emphasizes on belief, for instance, the belief of user related to the significant rise of output caused by the use of certain system or technology. The affective component is the reaction associated to the preference of new system or technology. The behavioral component can be defined as users' attitude linked to the true activities or aims of the users in relations to the new system or technology. The last component, perceived control, concerns about the feeling of ease or difficulty of carrying out a specific behavior (e.g. Davis, Bagozi & Warshaw, 1992).

The term affective is related to individual's positive and negative perceptions such as delight, happiness, unhappiness, and aversion (Triandis, 1980). The earlier study exposed that there is a strong relationship between affective component and behavior. Positive affect of a learning tool supported students to acquisition of positive involvement, information, and self-efficacy related to practice, while negative affect provoked students to avoid the learning tool (Arkkelin, 2003).

Based on Saade & Kira (2006), there is positive correlation between affect and perceived usefulness. In addition, there is positive association between affect and perceived ease of use. Thus, the fourth and fifth hypotheses are built as follows:

Hypothesis 4: Affect is related positively to Perceived Usefulness

Hypothesis 5: Affect is related positively to Perceived Ease of Use

2.6. *Anxiety (ANX)*

In addition to affect, anxiety (ANX) is added as an external predictor on TAM. The reason to add anxiety as an external predictor is due to its significant effect to perceived usefulness and perceived of use (Montazemi et.al., 2015).

Technology anxiety is defined in numerous standpoints. Some scholars described technology anxiety as a state of mind of being dreadful or uneasy when using or in view of the use of new technology such as computer. According to Brosnan (1998), variables affecting the acceptance to the new technology, such as computer, are success or failure experience of using hardware or software, and present jobs related to the computer including new computer applications. The researchers have forecasted the factors such as age, gender, ethnicity, previous computer experience, mathematics anxiety, self-efficacy, learning styles, and computer attitude as factors affecting the technology and computer anxiety (Saade & Kira, 2006).

According to Saade & Kira, (2006), there is negative correlation between anxiety and perceived usefulness. Moreover, there is also negative correlation between anxiety and perceived ease of use. Therefore, the sixth and seventh hypotheses are created as follows:

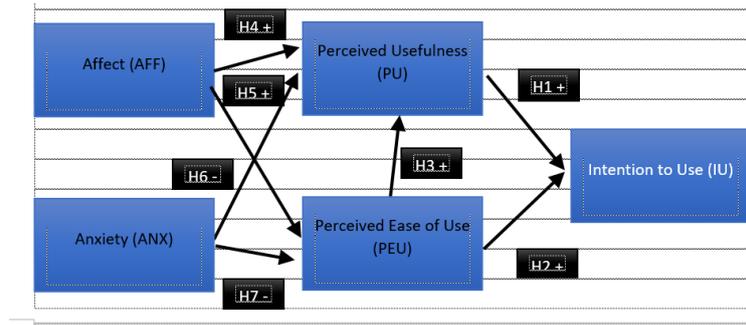


Figure 2. Technology Acceptance Model with Extensions
(Davis & Venkatesh, 1996; Saade & Kira, 2006)

Hypothesis 6: Anxiety is related negatively to Perceived Usefulness

Hypothesis 7: Anxiety is related negatively to Perceived Ease of Use

Based on the theory above and considering that AFF and ANX may influence PU and PEU and that this impact varies depending on the characteristics of the new technology used (in the present case, the new technology is Siskeudes) and the context it is used, we hypothesized as described in Figure 2.

3. Research Methodology

3.1. Sample

The research was conducted in Tangerang district since all its 246 villages have completely implemented Siskeudes since 2015. To obtain better understanding of the operators' acceptance on the Siskeudes, random sampling is applied in this study. By using Isaac and Michael calculation to determine the sample of this research (Sugiyono, 2013), the number of sample collected is 151 respondents with 5% margin of error. The respondents in this study are the operators who use Siskeudes most in the villages.

3.2. Procedures

To estimate the relationship among multiple variables and describe the relationship pattern between latent constructs and indicators/observed variables, Structural Equation Modeling (SEM) was utilized. SEM, which is often employed to analyze human behavior in society, combines regression and confirmatory factor analysis as well as path analysis (Schumacker and Lomax, 2010). Schumacker and Lomax (2010) mentioned that a regression consists only of a dependent variable which is predicted by one or more independent variables, while path model permits multiple dependent and independent variables. Whereas, confirmatory factor analysis contains observed variables hypothesized to measure one or more latent constructs.

Before analyzing the data, it is necessary to test the statistical assumptions including normality data, heteroscedasticity, and multicollinearity. Sudarmanto (2005) argued that meeting those statistical assumptions are important to avoid bias statistical estimation and inference. Alternatively, when the statistical assumptions in this study are unable to meet, Partial Least Squares (PLS) will be utilized since PLS is a less restrictive modelling analysis in terms of

Table 1. Questionnaire items modified from Saade and Kira (2006) and Davis (1989, 1993, and 1996)

Construct	Item	Measure
Perceived Usefulness (PU)	PU1	Making financial report would be easier using Siskeudes.
	PU2	Using Siskeudes improves the quality of the financial report.
	PU3	Using Siskeudes enables me to accomplish tasks more quickly.
	PU4	Overall, Siskeudes is useful to support my job.
Perceived Ease of Use (PEU)	PEU1	Learning to operate Siskeudes will be easy for me.
	PEU2	To become skillful at using Siskeudes will be easy for me.
	PEU3	I make many errors when using Siskeudes.
	PEU4	Overall, Siskeudes is easy to use.
Intention to Use (IU)	IU1	Assuming I had access to Siskeudes, I intend to use it
	IU2	Given that I had access to Siskeudes, I predict that I would use it.
Affect (AFF)	AFF1	I like working with computers.
	AFF2	I have a lot good experience working with computers.
	AFF3	I like to spend my time working with computers.
	AFF4	Using a computer is frustrating for me.
Anxiety (ANX)	ANX1	I feel apprehensive about using computers.
	ANX2	I rarely working with computers.
	ANX3	I hesitate to use computer for fear of making mistakes.
	ANX4	Computers are somewhat intimidating me.

distribution assumptions (Sellin, 1995). Furthermore, he also mentioned that PLS is a variance-based approach to predict and confirm the model with large and complex path model, weak underlying theory or small data (Wold & Noonan, 1982). To compute the data, Microsoft Excel and SmartPLS were exploited in this study.

3.3. Questionnaires

Questionnaires were modified based on the studies conducted by Saade and Kira (2006), modification and extensions from Davis (1989, 1993, and 1996). All questionnaire items, to measure variables PU, PEU, AFF, ANX, and IU, will be designed based on the 5- Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). All constructs and questionnaire items in this study are listed in Table 1.

4. Results

R square and T statistics of path coefficient were measured to evaluate inner model of the constructs. R square and T statistics are shown in Table 2 and 3. From Table 2, the construct IU is described by its indicators at 43,6%. The construct IU is described by other constructs, PEU and PU at 43,6%. The next construct, PU is described by other constructs, PEU, ANX and AFF at 36,1%. The last construct of the model, PEU is described by other constructs ANX and AFF at 10,2%.

Table 2. R Square

	Original Sample (O)	Sample Mean (M)	Standard Deviation	T Statistics (O/STDEV)	P Values
IU	0.436	0.444	0.067	6.510	0.000
PEU	0.102	0.117	0.052	1.953	0.051
PU	0.361	0.374	0.060	5.985	0.000

Table 3. T Statistics of Path Coefficients

	Original Sample (O)	Sample Mean (M)	Standard Deviation	T Statistics (O/STDEV)	P Values
AFF -> PEU	0.267	0.256	0.091	2.945	0.003
AFF -> PU	0.111	0.104	0.076	1.461	0.145
ANX -> PEU	-0.098	-0.116	0.087	1.127	0.260
ANX -> PU	-0.218	-0.227	0.079	2.774	0.006
PEU -> IU	0.411	0.411	0.073	5.624	0.000
PEU -> PU	0.458	0.454	0.063	7.277	0.000
PU -> IU	0.342	0.342	0.075	4.547	0.000

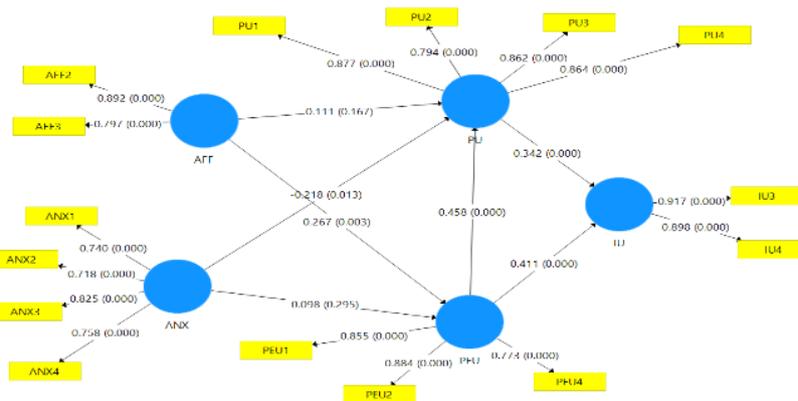


Figure 3. Path Diagram with Coefficient and P-value

The last inner model evaluation is measurement of T statistics of the path coefficient. The T statistics shown in Table 3 are all higher than 1.96 except for coefficient from AFF to PU (1,461) and coefficient from ANX to PEU (1,127). In addition, the P value for both path coefficients are also not significant (P value > 0,05). The P value for path coefficient from AFF to PU is 0,145 (P value > 0,05), and P value for path coefficient from ANX to PEU is 0,260 (P value > 0,05).

5. Discussion

Hypothesis testing was created by using Partial Least Squares (PLS) analysis. Null hypothesis (Ho) is determined as the absence of relationship between exogenous variable and endogenous variable. Meanwhile, alternative hypothesis (Ha) is determined by the existence of relationship between exogenous variable and endogenous variable.

The decision was made based on the alpha score. If the alpha score is less than 0,05, Ho will be rejected and Ha will be accepted. On the contrary, if the alpha score is higher than 0,05, Ho will be accepted and Ha will be rejected. That Ha is accepted means that exogenous variable affects endogenous variable. On the opposite, exogenous variable does not affect endogenous variable. In addition, T-test will be conducted to measure the significance level of the relationship between exogenous variable and endogenous variable.

Table 4. Compilation of Proposed Hypothesis

Hyp	P-value	Details
1	0,000	PU has significantly positive correlation with IU
2	0,000	PEU has significantly positive correlation with IU
3	0,000	PEU has significantly positive correlation with PU
4	0,167	AFF has insignificantly positive correlation with PU
5	0,003	AFF has significantly positive correlation with PEU
6	0,013	ANX has significantly negative correlation with PU
7	0,295	ANX has insignificantly negative correlation with PEU

The outer loadings should be more than 0.7, therefore PEU→PEU3, AFF→AFF1, AFF→AFF4, IU→IU1, IU→IU2, and IU→IU5 should be removed. Thus the revised model becomes a model as shown in Figure 3. The next discussion will be based on Figure 3 and Table 4.

Based on the result, the traditional TAM, relationship between PEU, PU and IU are supported in this study. Furthermore, Siskeudes' easiness to use is the strongest predictor of intention to use in this study. Additionally, this study also confirms Saade and Kira's paper (2006) which argued that individual's positive perception explained perceived ease of use of application positively and computer's anxiety negatively influenced individual's perceived usefulness.

Regarding the relationship between PU and IU, this study is in line with Davis and Venkatesh's finding (1996) which mentioned that PU is one of variables affecting IU. There are many factors affecting the acceptance of new technology, one of those is the belief of people that the new technology will make their jobs getting easier (Davis, 1989). The same results were showed by previous researches such as Davis and Venkatesh (2004), as well as Venkatesh, et al. (2003). They stated that the operators' perception that Siskeudes will enhance their jobs affects their intention to use the application. Accordingly, PEU predicts IU positively showing the same results acquired by Davis (1989, 1993, and 1996), Davis and Venkatesh (2004), and; Saade and Kira (2006). When the operators perceive that Siskeudes is user friendly, they intend to use the application more since operating Siskeudes needs less effort. Related to third hypothesis, the path analysis in this study confirms that PEU is significantly and positively affect PU. The result strengthens previous researches, such as Sharp (2007) which indicated that PEU directly influences PU. Moreover, other findings such as Davis (1989, 1993, and 1996) and Davis and Venkatesh (2004) also enhances the finding. The respondents' perception about the ease of using Siskeudes has direct affect to their perception related to the belief that they can increase their job performance by means of Siskeudes.

The regression analysis in Figure 4 showed that there is a positive and significant relationship between positive feeling on using computer and PEU of Siskeudes at 5 percent significant level. Isen (2008) mentioned that when people are in good mood, they will experience positive thoughts which will assist their brain to process. In other words, positive feeling plays a beneficial role in the perception of people related to user friendliness of a system. Furthermore, people with positive emotion toward certain system revealed more clarity and better information absorption and integration when solving problems or facing challenges, thus, resulting in better adoption of the system (Djamasbi et al., 2010). It can be concluded that affect influences perceived ease of use of Siskeudes significantly. In addition, the research showed that computer anxiety negatively influenced perceived usefulness of Siskeudes which supported hypothesis 6. It is in line with the study of Webster (1989) and Igarria & Chakrabarti (1990) which found that people feeling uncomfortable with the computer were more likely to

produce undesirable results and eventually unable to enjoy working with the application. It is suggested that reducing computer anxiety could be important to increase users' perception about Siskeudes, mainly the usefulness and probability of using it. Furthermore, Igbaria and Parasuraman (1989) reported that training is beneficial to increase individual's knowledge and skill on computers and Siskeudes which can ease people's anxiety.

Conversely, hypotheses 4 and 7 are not supported in this study. Possible explanation related to the insignificant result of affect and perceived usefulness is related to the rigidity of the application from the point of view of operators. Since Siskeudes is designed to assist village administrations to make financial reports which is quite inflexible to add, or revise types of activities, there may have been little alternative to operate Siskeudes in a creative way. In that way, Siskeudes is unable to capture the users' creativity which perhaps made the users question the usefulness of the application (Djamasbi et al., 2010). Thus, future research is needed to study the effect of inflexibility on perceived usefulness of application. Furthermore, computer anxiety, as shown in the finding part, has no relationship with Siskeudes' ease of use. Cascio & Montealegre (2016) verified that people who felt capable of learning to use or using new application tended to feel comfortable when the new application was introduced, thus, reduced the effect of anxiety on user friendliness of system. Moreover, experienced people have better self-efficacy and less computer anxiety (Decker, 1999). Based on the demographic characteristics of Siskeudes operators, on average, they have sufficient six years of computer experience. It can be concluded that the impact of anxiety on perceived ease of use is not significant due to the cancelling out effect of computer experience.

Based on the discussion above, this study proposes the revised version of the model as listed in Figure 4. The pathways from AFF to PEU and ANX to PEU are removed due to insignificant results.

6. Conclusion

Five proposed hypotheses about the operators' intention to use Siskeudes were verified in this study. Perceived of Usefulness (PU) correlated positively with Intention to Use (IU). Perceived Ease of Use (PEU) associated positively with PU and IU. Whereas, Computer Affect (AFF) connected positively

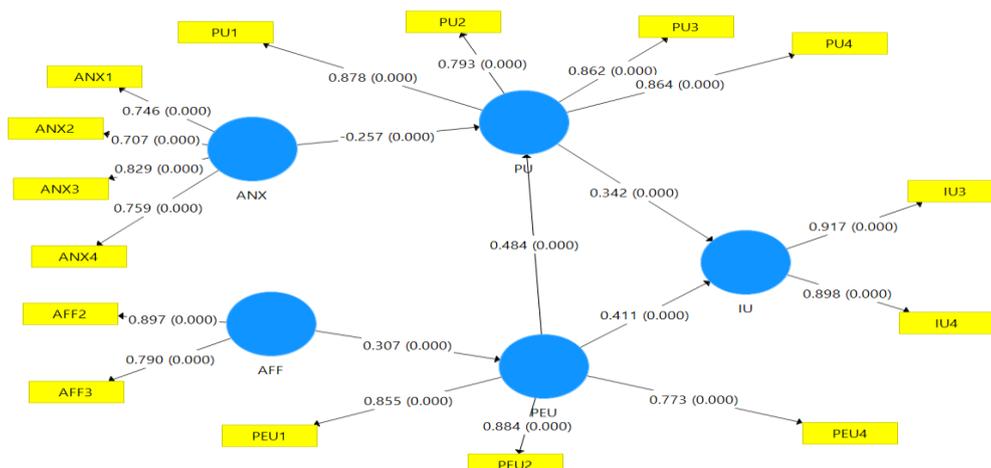


Figure 4. Revised Version of the Model

to PEU and Computer Anxiety (ANX) linked to PU negatively. On the contrary, two proposed hypotheses are unable to be confirmed in this study. ANX could not be associated negatively to PEU and AFF was not related positively to PU.

Due to the findings, revised version of the model (see Figure 4) was introduced. The revised model of TAM with extensions modified model suggested by Saade & Kira (2006), and reconfirmed the latest TAM model developed by Davis & Venkatesh (1996). However, when considering the calculated results, the research is still far-off from the conclusion. This study was conducted only in Tangerang district, thus, to provide better conclusion on the acceptance of Siskeudes, further study with larger coverage needs to be carried out. Furthermore, Siskeudes is still in development with continuous improvements by the developer when the study was conducted which makes the conclusion in this study need to be reconfirmed.

Future research related the Siskeudes inflexibility which may influence the PU should be generated. Moreover, the study linked to the computer experience which probably reduce the level of ANX should also conducted in the future to improve the revised model of TAM with extensions of AFF and ANX.

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