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# The effect analysis of cognitive and personal intention in using internet technology: An Indonesian students case study

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## Abstract

This research was designed to figure out whether cognitive factors which consist of perceived usefulness and perceived ease of use as well as personal factors which divided into computer anxiety, influencing the intentions of internet usage among students. Furthermore, this research would also like to compare the cognitive and personal model in influencing the internet use intention. We use quantitative descriptive to analyse the data gathered through questionnaires among the students of State Islamic University Sultan Syarif Kasim (UIN SUSKA) Riau Indonesia, which actively and daily using the computer and internet technology. These students were chosen as samples through simple random sampling and processing data by using multiple linear regression analysis. The results showed that perceived usefulness from cognitive factor affecting the intention in using internet while perceived ease of use does not affect the intention of using the internet. It is also found that anxiety computer from personal factors does not affect the intention in using internet technology. Oppositely, the intentions feelings affect the intention in using internet technology. When it comes to the comparison, it could be concluded that cognitive factors also do not have a greater effect when compared with personal factors of students in using internet.

**Keywords:** Cognitive, personal, intentions, internet technology

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## 1. INTRODUCTION

The development of information systems technology, especially the Internet has already touched a large amount of users. A significant number of increasing the Internet users has been creating internet culture. The Internet also has a far-reaching influence on the development of science, by simply using a search engine such as Google and Yahoo, users will have a worldwide access to many variety of information. Compared with books and libraries, the Internet represents the extreme spread of knowledge, information and data. Besides making development in information and technology, the appearance of the Internet has also affected economic development. It triggers different types of transactions that used to be done face to face into remote transaction. Towards individual users, information systems technology has benefits and direct impact, especially in increasing productivity (Hartono, 2007). Some research have been done in the field of information system stated that the use of personal factors are very important for predicting the use and adoption of technology (Lucas, 1981) in Nazar (2008). Researchers have also noticed that personal factors are relatively volatile, such as individual attitudes (attitudes towards computers).

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According to Davis (1989), cognitive factors divided into perceived usability (perceived usefulness) and perceived ease of use. Perceived usefulness is described as how a person believes that technology will improve their performance. Besides that, perceived usefulness is an assertion about the decision-making process especially when a person believes that the system is useful then he/ she will use it. Conversely, if a person believes that the system is less useful, then he will not use it. Perceived ease of use according to Davis et al. (1989) defined as a person's level of confidence that the use of a particular system is not required effort. Despite efforts by every person is different, but in general, to avoid rejection of users on the developed system, then the system must be easily applied by the user without removing the efforts that are considered burdensome.

Since the 1980s, researchers have learned a lot of information system how and why individual behaviour using information systems. Intention to behave (behavioural intention) and behaviour itself are two different things (Hartono, 2007). Intention to behave will always be an intention. In other words, intention is also the desire to perform the behaviour. Intention is not a behaviour, but the behaviour is already a real action or activity undertaken. Previous research conducted by McElroy et al. (2007) showed results that personality factors more influential than cognitive factors on the intention (intention) the use of the internet. While the research conducted by Nazar (2008) showed that cognitive models are even more influential than the model of personality to the intention of use of Internet technology. Based on the difference of the results of the two studies above, it is very interesting to do research again with reference to the research conducted by Nazar (2008).

This research was carried out on bachelor students in accounting from Faculty of Economics and Social Sciences UIN Suska Riau which are frequently use the internet technology to support their education and learning activities as well as for other purposes. We choose frequent internet user bachelor degree student based on the tendency of not maximal internet technology use. Due to that matter, it is interesting to look at the factors that influence it. In this study, the problem can be formulated as follows:

1. Are cognitive factors: perceived usefulness and perceived ease of use can affect the intention to use the internet
2. Are personal factors: computer anxiety and feelings can affect the intention to use the internet?
3. Are cognitive models more influence intention to use the internet than personal model?

## **2. THEORETICAL FRAMEWORK**

### **2.1. Intention**

In information systems research, it is important to discover how and why individuals accept and adopt new information technology (Agarwal & Karahanna 2000). At the individual level, the use of technology was observed by examining the role of intention as a predictor of behaviour (Liu et al. 2004; Malhotra et al. 2004). This study focuses on the determinants of intention such as attitudes and personal factors influence. Intention as determinants of behaviour has been specified in the reference information systems and other disciplines (Ajzen 1991; Taylor & Todd 1995). According to the theory reasoned action which predicts behavioural intention, Intention is defined as a formed by the attitude and subjective norm which is set up a trust. The theory is based on a model to predict the behaviour of the activities under the control of volitional. Volitional control tools are fully capable use for controlling the performance of an activity. In case of non-volitional controlling activity, the theory reasoned action (TRA) suitable because it has additional component of behaviour perceived as determinants of intention. As the adaptation of TRA, there is Technology Acceptance Model (TAM) which determines the antecedent information system usage through a system of beliefs and ease of use of an information system (Davis, 989B).

### **2.2. Cognitive (Perception)**

Cognitive psychology is the scientific knowledge of psychology that studies cognition, namely the mental processes that underlie behaviour. Cognitive psychology has extensive domain research including working memory, attention, perception and knowledge representation, reasoning, creativity and problem solving (Hartono, 2007). One theory about the use of information technology systems that are considered highly influential and is commonly used to describe an individual acceptance of the use of information systems technology is the Technology Acceptance Model or TAM. This theory was first introduced by Davis (1986). TAM developed from the theory of reasoned action or TRA by Ajzen and Fishbein (1980). Cognitive factors in this study using the basic research with high validity of the instrument, which is based on research Davis (1989), namely: perceived usefulness and perceived ease of use.

### **2.3. Personality**

Personality defined as a set of characteristics and a stable trend that determines the commonalities and differences of thoughts, feelings and actions (Maddi, 1989). A personality characteristic is a pattern of long-term trend of consistent behaviour. Personality factors introduced by Goldberg (1990) who classified it into five stages: 1.) Openness to experience, is the tendency to explore new experiences and innovative ideas. Such individuals can be described as creative, imaginative, reflective and modern while on the contrary, if its openness to experience low, it can be characterized as a conventional, having a low interest and not analytical. Openness someone against something can trigger something new acceptance of one's life and also improve one's skills. 2.) Conscientiousness, defined as the tendency of the discipline, responsibility, task in achieving the goals themselves. Individuals who have conscientiousness will tend to avoid the problem and determine a high level of success through the plan and have a purpose and diligent. While individuals who have low conscientiousness would easily give up, lacks ambition and try things that provide short-term pleasure. 3.) Extraversion, a tendency in the simulation process and gain the benefit of others. Describing the presence of that person is assertive, dominant, energetic, active, lots of talking and enthusiastic. Individuals who have a high extraversion is often referred to as extroverts tend to be full of passion, love with people and groups, the hustle and stimulation. 4.) Agreeableness is the tendency to accept what is. Individual that has high agreeableness have a tendency good, friendly, generous, happy to help and was able to unite with other people's desires. 5.) Neuroticism is the tendency of receiving unpleasant emotions easily. Individuals who have a high neuroticism have experience negative emotions, including anxiety, hostility, depression, self-awareness.

Acceptance of one's computer system positively related to success (DeLone, 1988). The use of factors of human characteristics associated with personality in information systems research has been done by previous researchers. McElroy et al. (2007) using the dimensions of the main properties of openness to experience, conscientiousness, extraversion, agreeableness, neuroticism (OCEAN) to determine the effect on the acceptance of the technology compared to cognitive factors. McElroy used these personalities in order to measure the acceptance of the technology for human innate personality factors, which are fixed and tend to be more stable than the cognitive factors. This finding also support the claim personality factors predicts more the acceptance of the technology than cognitive factors.

## **3. HYPOTHESIS DEVELOPMENT**

### **3.1. Perceived Usefulness Toward Intention in Using Internet Technology**

Perceived usefulness is the extent to which a person believes that using a technology will improve performance. Perceived usefulness is an assertion about the decision-making process. Based on the theory of motivation expressed by Deci (1975) in Hartono (2007), the acceptance of technology by the user is determined by two types of extrinsic and intrinsic motivation. Intrinsic motivation arises from the expectation of individual perceive which is derived from interaction with information systems application. Different from intrinsic motivation, the extrinsic motivation arises because of the expectations for the use of a particular technology system application received from individual interaction with the system. Previous research has shown that perceived usefulness construct a positive and significant influence on the use of information systems (Davis, 1989; Chau, 1996; Igbaria et al., 1997; Sun, 2003). Therefore, hypothesis built:

H1: Perceived Usefulness Affecting the Intention of Using Internet Technology

### **3.2. Perceived Ease of Use Toward Intention in Using Internet Technology**

Perceived ease of use is a degree of a person's belief that using a particular system is not required great effort (Davis, 1989). Despite efforts by every person is different, but in general, to avoid rejection of users on the system developed system, then the system must be applied by the user without removing the efforts that are considered burdensome. Perceived ease of use is one factor in the TAM model that has been tested by Davis et al. (1989). The results of these studies indicate that these factors may explain why a person is proven in using information systems and explains that the newly developed system is accepted by users. So that second hypothesis built:

H2: Perceived Ease of Use Affecting the Intention of Using Internet Technology

### **3.3. Anxiety Computer (Computer Anxiety) Toward Intention in Using Internet Technology**

Based on research conducted by Igbaria et al. (1989), Anxiety in using computer (computer anxiety) directly influence the intention to use technology because of its character as part of neuroticism. Computer anxiety is

defined as anxiety or fear of interacting with computers, irrespective of the real danger. In computer anxiety, it is related with high anxiety. High anxiety is a feeling or emotion arising from the use of web technology. Internet technology itself can be source of anxiety because it requires the user to understand the new and strange technologies applications. Internet also affects the emotion because it generates interactions with unknown situations or person. Further experience of the Internet presents potential risks such as viruses, spyware or an invasion of privacy of the users and other possibilities, because of its reflect the length of time (life time) of the computer experience. High anxiety illustrates the difficulty with the information technology that involves the internet.

In a research conducted by Igarria et al. (2004) the term used to describe the condition of anxiety concerns, desires and anxieties that are owned by individuals. Computer anxiety is the tendency of an individual to worry, anxiety, or anxious to use the computer at this time or in the future. Anxiety about the expected computer environment is negatively related to the use of computers. So it is expected that people avoid behaviour that is worrying. Research was also conducted by Fagan et al. (2003) show that computer anxiety as a negative reaction. This negative reactive has an influence on the use and satisfaction of information systems. Thus, third hypothesis built:

H3: Computer Anxiety Affecting the Intention of Using Internet Technology

### **3.4. Feelings Toward Intention in Using Internet Technology**

Cheung and Chang (2001) found that feeling significantly affect the interest in the use of the internet. Feeling is an open factor of personality. Triandis (1980) developed a theory called the theory of interpersonal behaviour. This theory proposes that the interests of behaviour is determined by the feeling that humans have on the behaviour, what they think about and what they are supposed to do. Triandis (1980) uses the term feeling which are feelings of happiness, happy, cheerful or happy, or depression, disgust, discomfort or hate are associated with an individual to a particular action. Compeau et al. (1999) defines the feeling is an individual preference on behaviour. So that fourth hypothesis built:

H4: Feelings Affecting the Intention of Using Internet Technology

### **3.5. Cognitive Factors versus Personal Factors Toward Intention in Using Internet Technology**

Some research have been done in the field of information system stated that the use of personal factors are very important for predicting the use and adoption of technology (Lucas, 1981) in Nazar (2008). Researchers have also noticed that personal factors are relatively volatile, such as individual attitudes (attitudes towards computers). According to Davis (1989), cognitive factors divided into perceived usability (perceived usefulness) and perceived ease of use. Perceived usefulness is an assertion about the decision-making process especially when a person believes that the system is useful then he/ she will use it, oppositely if a person believes that the system is less useful, and then he will not use it. Perceived ease of use according to Davis et al. (1989) defined as a person's level of confidence that the use of a particular system is not required effort. Despite efforts by every person is different, but in general, to avoid rejection of users on the developed system, then the system must be easily applied by the user without removing the efforts that are considered burdensome. In order to find out which one is more influential between cognitive and personal factors in intention of using internet, the fifth hypothesis built:

H5: Cognitive Factors More Influential Than Personal Factors in Affecting the Intention of Using Internet Technology

## **4. RESEARCH METHODS**

### **4.1. Population and Sample**

This research conducted on 5<sup>th</sup> semester accounting students of Faculty of Economics and Social Sciences who have completed accounting information systems, management information systems, and other subject related to the use of the internet. The frequency of using internet became our consideration because, this research require the basic understanding of internet technology. Non probability convenience sampling is chosen to facilitate the implementation of the research among wide population of Internet users. Besides, it is also difficult to make a real sampling frame for a list of Internet users.

## 4.2. Variables Identification

The dependent variable in this study is the intention which defined as the desire to do something. Intention is not always static, but may change with the course of time. Intention was measured with a five point Likert scale ranging points. This variable was measured using questions adapted from the research conducted by Davis (1989). As the independent variables of this research are:

- Perceived usefulness is the extent to which a person believes that using a technology will improve performance. It is measured by five point Likert scale. This variable was measured using questions adapted from the research conducted by Davis (1989).
- Perceived ease of use is the level of a person's belief that the use of a particular technology system is not required effort. It is measured by five point Likert scale. This variable was measured using questions adapted from the research conducted by Davis (1989).
- Computer anxiety is showing fear of the implications of the computer. Computer anxiety was measured with a Likert scale ranging points 1 stated strongly disagree to 5 points that states could not agree more. This variable was measured using questions adapted from the research conducted by Heinssen et al. (1987).
- Feelings (Affect) which are feelings of happiness, happy, cheerful or happy or depressed, disgusted, uncomfortable or hate associated with an individual to a particular action. Compeau et al. (1999) defines the feeling is an individual preference on behaviour. Feelings are measured by five point Likert scale. This variable was measured using questions adapted from the research conducted by Thompson (1991) and Compeau and Higgins (1999).

## 5. RESULTS AND DISCUSSION

### 5.1. Descriptive Statistics

Survey has conducted among 74 respondents, and the descriptive result is presented in the following table:

Table 1. Descriptive Statistics

Category	Description	Total	Percentage
Gender	Male	19	26 %
	Female	55	74 %
Age	19– 20	53	72 %
	21 – 24	21	28 %
Place for accessing internet	Campus	15	19%
	House	17	22%
	Internet Cafe	42	59 %
Internet Usage	1-5	31	41 %
Duration (year)	5-10	41	57 %
	>10	2	2 %

### 5.2. Testing Goodness of Fit Model

#### a. Coefficient of Determination

The coefficient of determination (adjusted R<sup>2</sup>) measures how far the ability of the model to explain variations in the independent variables. In this study, the adjusted R<sup>2</sup> value of 39.1, this suggests that the independent variable used can measure the intention to use the Internet 39.1%.

#### b. Simultaneous Significant Test

To examine the goodness of fit of a model, this research using a F statistical test. The F test basically aims to determine whether the independent variables included in the model jointly affect the dependent variable. Based on the test results of the F statistic, known calculated F value of 12 740 with a probability level of 0.000 (significance). Because the probability is smaller than 0.05, it can be said that the independent variables simultaneously affect the dependent variable.

### 5.3. Hypothesis Testing Results

#### a. 1<sup>st</sup> Hypothesis Testing

1<sup>st</sup> Hypothesis test aimed to determine whether the perceived usefulness of variables affect the intentions of students in the use of internet technology. Based on the results of t test statistics show that t table of perceived usefulness of 3,768 is greater than t table for N = 74 is equal to 1.994 with a significant value of 0.000. In addition, the regression coefficient for perceive usefulness variables showed a positive value which is equal to

0.445. This means that the perceived usefulness has a positive and significant effect on the intentions of students in the use of internet technology. Thus the first hypothesis proposed in this study can be accepted.

**b. 2<sup>nd</sup> Hypothesis Testing**

2<sup>nd</sup> Hypothesis test aimed to determine whether variables affect the perceived ease of use intentions of students in the use of Internet. Based on the results of t test statistics show that t table of perceived ease of use of 1.082 is smaller than t table for N = 74, equal to 1.994 with a significant value of 0.283. This means that the perceived ease of use does not affect the intentions of students in using internet technology. Thus the second hypothesis proposed in this study was rejected. The reason why perceives ease of use not affecting student's intention in using internet technology because of most samples of this research are frequent user of internet technology. Thus, they might not feel that internet technology difficult for them.

**c. 3<sup>rd</sup> Hypothesis Testing**

3<sup>rd</sup> Hypothesis test aimed determine whether computer anxiety variables influence the intention of computing students in the use of the internet. Based on the results of t test statistics show that t table of computer anxiety 0.771 is smaller than t table for N = 74 is equal to 1,994 by 0479 a significant value. This means computing anxiety does not affect the intentions of students in the use of internet technology. Thus the third hypothesis proposed in this study was rejected. Related to the previous hypothesis, most sample of this research have engaged and used to work with computer. This might be the reason why this hypothesis rejected.

**d. 4<sup>th</sup> Hypothesis Testing**

4<sup>th</sup> Hypothesis test aimed to determine whether the variable feeling affecting student intention in the use of the internet. Based on the results of t test statistics show that t table for computer anxiety is 5,833 greater than t table for N = 74, equal to 1.994 with a significant value of 0.000. In addition, the regression coefficient for the usability perception variables showed a positive value that is equal to 0.653. This means that the variable feeling positive and significant effect on the intentions of students in the use of internet technology. Thus the fourth hypothesis proposed in this study can be accepted.

**e. 5<sup>th</sup> Hypothesis Testing**

5<sup>th</sup> Hypothesis test aimed to determine which one is more influential factor between cognitive factors and personal factors on the intentions of students in the use of internet technology. Tool used to test the hypothesis is chow test. The test results can be seen in the chow test the following table:

Table 2. Regression Test						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	238.104	4	59.526	12.740	.000 <sup>a</sup>
	Residual	322.382	69	4.672		
	Total	560.486	73			

  

Table 3. Regression Test Result for Cognitive Factors						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	168.051	2	84.025	15.202	.000 <sup>a</sup>
	Residual	392.436	71	5.527		
	Total	560.486	73			

  

Table 4. Regression Test Result for Personal Factors						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	184.722	2	92.361	17.451	.000 <sup>a</sup>
	Residual	375.765	71	5.292		
	Total	560.486	73			

Based on Table 3, 4, 5 above, mathematical equation can be written as follows:

$$F = \frac{SSRr - SSRu}{SSRu/(n - k)}$$

$$F = \frac{322.382 - 375.765}{375.765/(74 - 4)}$$

$$F = \frac{-53.383}{5.3}$$

$$F = -10.07$$

From the test result above we can see that chow test calculations obtained F count equal to -10.67 while the tables of critical values for the F distribution (Ghozali, 2001) the value of F table with a 5% significance level was 2.35. Negative calculated F value indicates that both factors are in fact is a unity that is not assessed differently. Both of these factors have a relationship that is mutually related and statistically significant. Therefore, it can be concluded that cognitive factors have a greater effect when compared with personal factors.

Based on the calculation above, the 5<sup>th</sup> hypothesis testing resulted that cognitive factors is not more influential than personal factors are. So, the 5<sup>th</sup> hypothesis is rejected. This means that the confidence level of students on usability and ease of use of the internet is not a greater effect when compared with computer anxiety level, A-level students in using the Internet, in order to predict the intentions of students in the use of Internet technology. The results of this study are not consistent with the research (Nazar, 2009) which showed that cognitive factors more influential than personal factors.

## 6. CONCLUSION

Based on the hypothesis test result, it can conclude that:

1. Perceive usefulness has a positive and significant effect on the intentions of students in the use of internet technology
2. Perceived ease of use does not affect the intentions of students in the use of internet technology.
3. Computer anxiety variable does not affect the intentions of students in the use of Internet technology.
4. Feeling affects the intentions of students in the use of Internet technology.
5. Therefore, for the comparison test result between cognitive factors and personal factors in affecting the intentions to use internet among student, we can conclude that cognitive factor not affecting more than personal factors.

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