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Technology Acceptance Model and Operant Conditioning Learning Theory: The development of *Lasem Batik E-Book* for Junior High School Students at Yogyakarta

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Abstract

E-book, or electronic book, is a book based on electronic media. This research examined the development of an E-book by using operant conditioning learning theory. This method is used to draw the attention of junior high school students to use e-book. This e-book will provide information on Indonesian batik, especially in Lasem. This study also examined the opinions and behaviors of junior high school students in Yogyakarta on this e-book by using TAM (Technology Acceptance Model) with added variables. Perceived self-efficacy were added to see if students are accustomed to use the computers. In addition, result demonstrability is used to see if the students knew the benefits provided by the *Lasem batik* e-book. Finally, injunctive norm were used to measure the influence of the surrounding environment that affects one's perception of the e-book.

Keywords:

e-book, TAM, operant conditioning, self Efficacy Result demonstrability, injunctive norm

1. Introduction

In the 2012's era, media technologies has been undergo rapid development. e-book media is one of the example, which is a reading material that provides information and knowledge centered on the user interaction.

The aim of this study is to see if the junior high school students in Yogyakarta would accept e-book media as a reading material and as a knowledge and information sources. This study used a case study of *Lasem batik* e-book. The e-book was created by exploiting the operant conditioning

learning theory, constructed on a "reward" based stimulation in which the students were expected in using this e-book technology for their study purposes. In order to deal with the technology aspects of the e-book this study use TAM as a framework to measure the students' technology acceptance.

2. E-book

The definition of e-book is a collection of data that displays the information in a dynamic and reactive based multimedia (Henke, 2001). The PDF format of e-books were initially backed by large companies. On the other hand, there are many independent program makers who were developing e-books which were more attractive by combining animation, text, and pictures simultaneously (Lancy & Hayes, 1988; Reinking, 1997).

In 2010, there were rapid grow of e-book for public libraries in the United States that used e-books to provide knowledge and information (Orey, Jones, & Branch, 2011).

The benefits of using e-books in the education sectors is to encourage and motivate the students to learn about something new, and the students is expected to memorize and understand the information revealed in the e-book in a fun way (Cordova & Lepper, 1996). E-book can have multiple media elements that stimulates students to be more actively learned, such as: images, animations and games (Lancy & Hayes, 1988; Reinking, 1997). Information will be memorised easier with attractive appearance and added sound media that supports the content of the e-book (Kamil, Intrator & Kim, 2000).

3. Lasem Batik

Batik textile is an Indonesian cultural heritage that were expected to be preserved and studied by future generations in Indonesia. Batik textile combines varieties of cultures and the local resources availability, thus different areas in Indonesia have different batik characteristic. The word batik originated from a Javanese "amba" which means writing and the "titik" means a point (Suryahadi, 2008). Batik techniques have been known since hundreds of years ago but there is no clear evident of history on the origins of batik.

Lasem is a one small city in Central Java which is an area of many batik producers, therefore batik produced from this region is called "batik Lasem" or *Lasem Batik*. *Lasem Batik* is initially not very well known by the public, but through time, *Lasem Batik* are known by the public because they have unique characteristics, colors, and patterns that are different from other regions'. *Lasem Batik* originated from acculturated Chinese culture in Java (Lee, Sucipto, & Triana, 2008), it can also be called "batik encim".

According to previous research, the reading materials about *Lasem Batik* by the public is very hard to find. Thus, the e-book is expected to assist in the dissemination of information about the history and characteristics that distinguish of *Lasem Batik*.

4. Operant Conditioning Learning Theory

Learning is a process that is permanent and is influenced by the behavior, knowledge, and thinking skills that occurs through experience (Klein, 2009). The e-book were developed by using operant conditioning learning approach (Skinner, 1938) in which the consequences of a behavior change can affect one's learning abilities.

The main architect of operant conditioning theory is Skinner, which is heavily influenced by Thorndike. According to Thorndike, changes of behavior followed by a positive results will be strong and changes of behaviors followed by negative results would be weak (Thorndike, 1906). These consequences could be applied in learning behavior by two categories - consequences which stimulate one's learning ability is called reinforcement or reward, and the consequences

which may reduce a person's motivation in learning behavior is called punishment (Santrock, 2011).

5. TAM

In 1985, Fred Davis introduced the Technology Acceptance Model or TAM. This model may provide an overview or estimate of a person's response to a technology.

Originally, Davis developed TAM conceptual model based on the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975). This theory argues that motivation can be broadly divided into two: perceived usefulness that explain a technology is accepted if perceived to be useful and perceived ease of use describes that a person can accept a technology if the technology is perceived to be easy to use. Two of these perceptions will affect a person's attitude toward technology (Davis, 1986). Davis also suggested that perceived usefulness and perceived ease of use can be influenced by external variables.

In social psychology, attitude describes people, objects, and ideas. Attitude is also a process of evaluation of the positive and negative reactions about something. Humans are not naturally researcher in the world but the assessor of what they see (Bargh, 1996).

In 1989, Davis developed TAM further by including behaviour intention, in which Attitude and perceived usefulness will affect someone's intention to use the technology. Behaviour intention is the tendency of a person to use a technology. Furthermode, Davis also looked at the relationship between perceived ease of use and perceived usefulness. They are both related because people tend to use technology that is easy to use (Adams, Nelson & Todd, 1992) and useful (Venkatesh, 2000). TAM Figure can be seen in Figure 1.

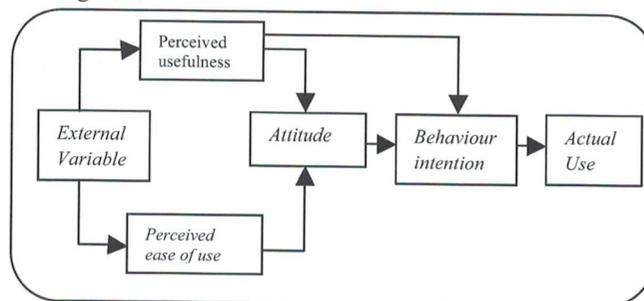


Figure 1. Technology Acceptance Model

In this study, the actual use variable was not measured because the study only measured the intention of the junior high school students to use e-book technology.

6. Self Efficacy

Perceived self-efficacy describe a person's beliefs to perform a particular behavior (Bandura, 1997). Perceived self-efficacy to use computer is affected by his own perception of his ability in using computer (Compeau & Higgins, 1995b). Perceived of self-efficacy may be the basis for understanding the behavior of an individual relating to the acceptance or rejection of technology (Olivier & Shapiro, 1993).

Perceived self-efficacy is correlated with computer use (Potosky, 2002) to determine whether acceptance of using computer technology can also be influenced by the person's first experience of using a computer (Rosen & Weil, 1995). If a person's first experience of using a computer has a positive impact, a person will accept the use of a computer in his life. If a person's first experience of using a computer has a negative impact, the person tends to reject the use of computers because there has been a perception that the use of computers is not easy (Chen, 1986).

Influence a person's self-efficacy can influence the formation process of a person's attitude on stage affective component that can be seen from the level of stress and depression one person from each individual's experience (Bandura, 1997 in Lewis, Templeton & Byrd, 2003).

The theory of self-efficacy will be adjusted in the study of computer self-efficacy. Computer self-efficacy is a decision of each individual that he has the ability to use a computer (Compeau & Higgins, 1995b). In some studies, computer self-efficacy has a positive influence on one's intention in the use of computers (Venkatesh et al., 2003).

7. Norm injunctive

Conformity is a change in behavior that is influenced by the people around him (Turner, 1932). One can know the situation around by asking people about what he thinks and sees (Kelley, 1955; Thomas, 1928).

Other people influences will lead one to adjust to seeing others as a source of information that will serve as a guide to shape their behavior because they believe in the interpretation of others more than themselves; this effect is called informational social influence (Cialdini, 1993). An important factor in the informational social influence is to adjust the behavior of others to believe in him and that what other people do and say is true, it is called private acceptance (Sherif, 1936).

The application of theory of confirmity is in changing the behavior of a person, one should know about social norms or social norms that exist (Aronson, Wilson, & Akert, 2004). Social norms are rules that explain that the public have acceptable behaviors, have values and beliefs (Cialdini, 1993). Subjective norms that influence the surrounding environment can shape a person's behavior and one's perception of things (Hale, Householder & Greene, 2003). Some researchers have found a significant association between social norms with subjective norms (Sheppard, Hartwick & Warshaw, 1988), but there are some researchers to believe that subjective norms and social norms approach, both, shape behavior (Hartwick & Barki, 1994; Venkatesh & Morris, 2000).

Social norms have two types of approaches, which are injunctive norms and descriptive norms (Cialdini, Reno & Kallgreen, 1991). Injunctive norms are one's perception of behaviors that should and should not be followed by another person or the community. Descriptive norms are perceptions of how people follow other people's behavior in certain situations. Injunctive norms produces a stronger influence than descriptive norms (Aronson, Wilson & Akert, 2004).

8. Result demonstrability

Result demonstrability is a person's perception of the advantages in the use of technological innovation and refers to the previous perceived usefulness that has been developed on TAM (Moore & Bensabat, 1991).

Result demonstrability also allows the user to observe and communicate the results of the use of technological innovations (Agarwal & Prasad, 1997). Perceived ease of use is one's perception of ease in using technology (Davis, 1986).

9. Mindset

A person who knows the benefits of the technology will have a positive thought on the usability of the technology. A person who has the confidence to use it would have had the intention to use the technology and thought that the technology is easy to use. A person's attitude can also be influenced by the surrounding environment.

Perceived ease of use of a technology will affect one's perception of the effectiveness of a technology and this affects both of them. One's perception of the effectiveness of technology and one's attitude will also affect a person's intention to use e-book technology. So, from an explanation of each theory to be used, it can be a number of possible relationships between the study variables that can be seen in Figure 2.

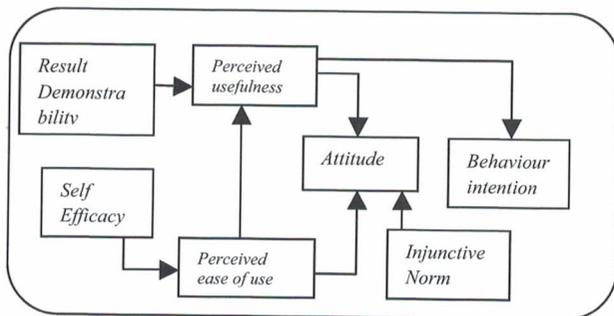


Figure 2: Results of the study of influence of each variable

10. Research Methods

In this study, data were collected from a junior high school in Yogyakarta at 2012. The e-book was presented in a class and the students were asked to use the e-book and filled in the questionnaires afterwards. The questionnaires were developed from the existing and available measurement tools, and customized it to fit the needs of the research and analysed according to the chosen added variables.

To calculate the effect of the independent variables to the dependent variable, simple linear regression will be used. Simple regression calculates the effect of one independent variable with the dependent variable (Santoso, 2009).

11. Results

A person's early experience on a subject, particularly in the use of computers, provides a large impact on one's perception about the ease of a technology. Table 1 describes the influence of variables that has been processed.

Influences	F	F Sig
SE - PEOU	33,390	0,000
RD-PU	15,648	0,000
PEOU-PU	10,097	0,003
PEOU-AT	9,119	0,005
PU-AT	12,489	0,001
IN-AT	10,060	0,003
AT-BI	28,489	0,000
PU-BI	7,468	0,010

Table 1: Results of the study of influences of each variable

This study will also provide an overview of how the correlation of each variable can be seen in Figure 3.

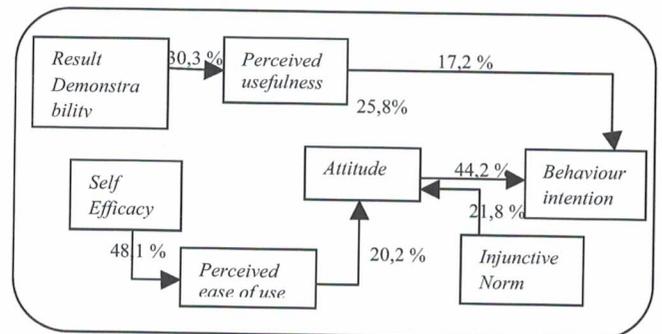


Figure 3: Results of the study of influence of each variable

11. Conclusion

The result of this study showed that the junior high school students were readily to accept and use the e-book, the student also intends to continue the use of it.

The e-book is considered to be helpful for the students to find out information about *Lasem Batik*. Furthermore, the e-book can improve their curiosity in the information provided as it was

developed in an interactive format. The students also learned the benefits provided by the technology of e-books. They inclined to think of e-book as useful. The environment variable can only affect a few students because they are highly individualistic. Furthermore, the students are also eager to know more about *Lasem Batik* and are enthusiastic to play the random batik drawing game available in the *Lasem batik* e-book.

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