

# The Influence ERPSim To Student's Learning Outcome in Enterprise Resource Planning (ERP) Course

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## Abstract

Today, business process and decision making depend heavily on information system such as Enterprise Resource Planning (ERP). ERP are complex information systems, which integrate business processes and decision-making at the organization level. It is challenge for accounting students to understand business processes and enterprise software usage without involvement in real-world practise. Accounting Program in Universitas Islam Indonesia using ERP software in their curriculum, aiming to expose students to real-world business processes. ERPSim is a business simulation game's tool to learn actual SAP and business processes. This study examines how ERPSim influence student's learning outcome in ERP course. Sample was 109 students who have taken ERP course in UII's Accounting Program. This study provides empirical evidence that enjoyment and cognitive appraisal of using ERPSim have positive effect to the intension to use ERPSim for learning business processes. While the intension to use ERPSim has a positive effect on the perceived learning outcomes but has no effect on the learning outcome's grading.

Keywords: ERPSim, Enjoyment, Cognitive Appraisal, Intension, Learning Outcomes

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## Introduction

In industrialization 4.0, business processes and decision making depend heavily on information systems such as Enterprise Resource Planning (ERP). ERP are complex information systems, which integrate every business processes and decision making at the company (Acar, Tarim, Zaim, Zaim, & Delen, 2017; Evaarnita & Kusuma, 2008; Marnewick & Labuschagne, 2005; Olson, Johansson, & De Carvalho, 2018). Understanding business processes and being able to use enterprise software are skills in great demand by industry and UII's Accounting Study Program incorporating ERP courses in the curriculum. But learning in the class will not give students a proper picture about how ERP system and business process in real-world work (Chen, Keys, & Gaber, 2015). To overcome this problem Accounting Study Program using ERP Simulation Games (ERPSim) as an innovative pedagogical approach to teach students in ERP-SAP Course. By playing software games, students can understand better business processes and ERP from learning by doing.

ERPSim (ERP Simulation Game) is an ERP teaching- learning software tool developed by HEC Montreal, Canada. ERPSim simulates a real-world marketplace in which virtual companies can operate business processes using a commercial version of SAP software (Leger, 2006). Previous research in ERP-SAP suggest that ERPSim improve student's understanding in operating ERP especially ERP-SAP (Chen et al., 2015; Cronan & Douglas, 2012; Hwang & Cruthirds, 2017; Léger, 2006). In 2015, Chen et al. investigate the effects of using ERPSim on perceived learning outcome at University of Wisconsin's student. This research suggest that enjoyment and cognitive appraisal using ERPSim improve student's understanding in business processes and operating ERP software. However, an extensive literature review indicates that little is known about causal relationships among cognitive-psychological factors, behavioral intention, and learning outcomes. This research aims to close the research gap with an empirical examines how enjoyment and cognitive appraisal of using ERPSim influence student's learning outcome. In this research, we examine how enjoyment and cognitive appraisal using ERPSim affect behavioral intention to use ERPSim. Also, we investigate the effect of intention to use ERPSim on learning's outcome. From the explanation that has been revealed, researcher hope that this research will give a better explanation about how the effect of enjoyment and cognitive appraisal to learning's outcome of using ERPSim as learning method.

## Literature Review

### The Theory of Planned Behaviour (TPB)

The theory of planned behavior (TPB) (Ajzen, 1991) suggests behavioral intention is a motivational factor that captures how much effort a person is willing to dedicate to perform a behavior and that it is the most influential predictor of behavior. According to TPB (Chen, Keys, and Gaber 2015) explain that there are three kind of believes that influence someone behaviour there are behavioral belief, normative belief, dan control belief. This three kind of behaviors will lead to the formation of a behavioral intention that in turn determines behavior and outcomes (Chen et al., 2015).

### ERPSim

ERPSim (ERP Simulation Game) is an ERP teaching- learning software tool developed by HEC Montreal, Canada. ERPSim simulates a real-world marketplace in which virtual companies can operate business processes using a commercial version of SAP software (Leger, 2006). In the classroom, student teams operate a virtual company using a SAP client. Each team uses standard ERP reports and transactions to manage all business processes involved in the marketing, inventory, sales, and forecasting of various bottled water products. The teams analyze these transactions and review financial reports during the simulation and compete against each other in the same marketplace with the goal of maximizing profit. The simulated marketplace provides students with opportunities to practice their business strategies and to develop hands-on skills to manage business processes using SAP clients. "Using the SAP simulation, students also develop technical skills through direct interaction with an actual SAP client." (Cronan and Douglas, 2012). Through ERPSim, students will learn about company management, business processes, analytic concept, and ERP concept. Seethamraju (2008) suggest that ERPSim improve student's understanding on implementing strategy, decision making, team performance, and also ERP concepts.

### Enjoyment

Enjoyment according to Venkatesh (2000) is the degree to which performing an activity is perceived as providing pleasure and joy in its own right, aside from performance consequences. Davis et al. in (Chen et al., 2015) explain that enjoyment in information system literature is the extent to which using a computer system is perceived to be intrinsically personally enjoyable. Because of that enjoyment can be refer as a enjoy experience when someone interact with technology. Davis, Bagozzi, & Warshaw (1992) explain that there are two thing that determine someone motivation there are intrinsic and extrinsic. Extrinsic motivation is referred to the performance of an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself. The example of extrinsic motivation are salary increase, promotion, and or benefits to someone. Intrinsic motivation is referred to "the performance of an activity for no apparent reinforcement other than the process of performing the activity itself. The example of intrinsic motivation is enjoyment.

### Behavioral Intentions

Behavioral intentions according to TPB (Icek, 1991) is a factors which measured how much an effort willing to dedicate to perform a behavior and that it is the most influential predictor of someone behavior. Behavioral intentions itself influence by three beliefs there are behavioral beliefs influence attitudes toward behavior, normative belief determines the subjective norm, and control belief shape perceived behavioral control. As a result, attitudes toward behavior, subjective norm, and perceived behavioral control together lead to the formation of a behavioral intention that in turn determines behavior and outcomes (Ajzen, 1991).

## Cognitive Appraisal

Cognitive appraisal is cognitive process that follow by behavioral outcomes adopted after the appraisal (Lazarus & Folkman, 1984). Cognitive appraisal is referred to individual interpretation and appraisal of situation in which someone is involved. Cognitive appraisal is a process of appraisal with (a) whether a situation or event threatens our well-being, (b) whether there are sufficient personal resources available for coping with the demand of the situation, and (c) whether our strategy for dealing with the situation is effective (Campbell, Johnson, & Zernicke, 2013). This appraisal can be divided into three subdivision there are primary appraisal, secondary appraisal, and reappraisal. Primary appraisal refers to the initial evaluation of the situation, deemed as benign positive (positive), threatening (negative), or irrelevant (neutral). If the situation is appraised as negative, the individual will make a secondary appraisal in regard to harm (harm-loss), threat, or challenge. Secondary appraisal refers to the evaluation of an individual's ability or resources to cope with a specific situation. Threat appraisals occur when it is anticipated that the situation may result in loss or harm in the future and the resources to effectively cope with the situation may not be available. A challenge is perceived when a situation is demanding but ultimately can be overcome, resulting in the individual benefiting from the situation (Campbell et al., 2013).

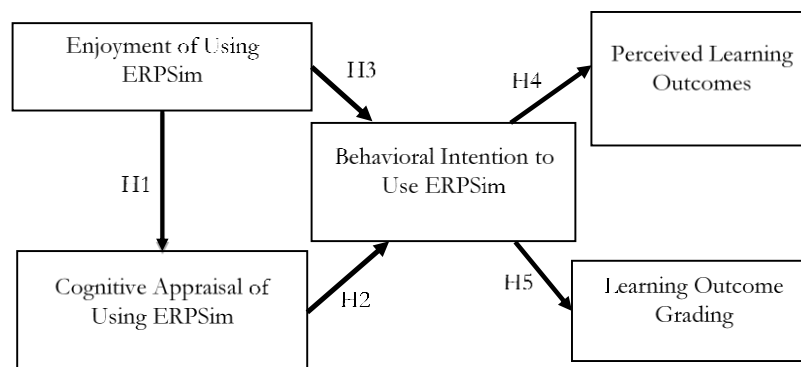
## Learning Outcome

Learning outcome according to Dimiyati & Mudjiono (2006) is a process to evaluate students about how far they understand the topic after learning process, this evaluation is marked with numbers, letters, or certain symbols that approved by education authority. But according to Mulyasa, (2008) learning outcome is a result of their study that indicate their competence and degree of behaviour. Competencies that must be mastered by students is measured with somethings that represent their ability. From the explanation that has been revealed, we can conclude that learning outcome is a level of student's ability to understand a topic after learning process. The level of understanding is measured using test that marked with numbers.

## Research Framework

In this research, research framework will be present in picture 1.

**Gambar 1.** Research Framework



## Research Methods

### Enjoyment vs Cognitive Appraisal

Enjoyment refers to the degree to which performing an activity is perceived as providing pleasure and joy in its own right, aside from performance consequences (Venkatesh, 2000). Enjoyment can be refer as an enjoy experience when someone interact with technology. Cognitive appraisal is self-assessment on the utilitarian aspect of attitude (Lee et al., 2012) while affective appraisal refers to self-evaluation on feelings and emotions (Breckler, 1984). Enjoyment is appeared when someone

doing an activity and it reduce their cognitive burden so they will give more afford on activity that they like. Enjoyment often makes individuals “underestimate” the difficulty of using technologies since they simply enjoy the process itself and ignore a task’s difficulty (Venkatesh, 2000). Thus, when someone enjoy for doing an activity will affect a cognitive appraisal by emotion since affective appraisal comes earlier in the human brain than cognitive appraisal (LeDoux, 1995; Lee et al., 2012). Accordingly, the following hypothesis is proposed:

H1: Enjoyment of Using ERPSim Has a Positive Effect on Cognitive Appraisal of Using ERPSim

### **Cognitive Appraisal vs Behavioral Intention**

Cognitive appraisal is self-assessment on the utilitarian aspect of attitude (Lee et al., 2012). It refers to an individual’s interpreting and assessing of the situation in which they are involved. Cognitive appraisal is a cognitive process followed by behavioral outcomes adopted after the appraisal. The theory of planned behavior (TPB) (Ajzen, 1991) suggests behavioral intention is a motivational factor that captures how much effort a person is willing to dedicate to perform a behavior and that it is the most influential predictor of behavior. According to TPB, when someone is doing an activity, they will assess whether that activity will give them a positive outcome, Thus, if they perceive favorably an information system are more likely to engage enthusiastically with their work with the system and explore system usage for maximum outcomes. When the students believe that using ERPSim help them learn business concepts and software usage easily and quickly, they have the motivation and inspiration to explore ERPSim and thus it will increasing the intention to use ERPSim. Accordingly, the following hypothesis is proposed:

H2 : Cognitive Appraisal of Using ERPSim Has a Positive Effect on Behavioral Intention to Use ERPSim

### **Enjoyment vs Behavioral Intention**

Enjoyment refers to the degree to which performing an activity is perceived as providing pleasure and joy in its own right, aside from performance consequences (Venkatesh, 2000). Enjoyment can be refer as an enjoy experience when someone interact with technology. According to TPB (Icek, 1991), enjoyment as an intrinsic behavioral belief is a positive influence on an individual’s behavioral intention and behavioral performance in a cognitive-psychological activity such as information systems usage (Davis et al., 1992; Venkatesh, 2000). According to Davis et al. (1992), Venkatesh (2000), Koufaris (2002), and (Wu, Hiltz, & Bieber, 2010) enjoyment is important factor that determine behavioral intention and outcomes. Enjoyment become one of factor of intrinsic motivation is also have influence in learning behavior when students interact with technology. Thus, enjoyment experience in using ERPSim will make students underestimate the difficulty of using ERPSim, and increasingly the intention to use ERPSim for learning business processes. Therefore, the following hypothesis is proposed:

H3: Enjoyment of Using ERPSim Has a Positive Effect on Behavioral Intentions to Use ERPSim

### **Behavioral Intention vs Perceived Learning Outcomes**

Thompson, Higgins, & Howell (1991) said that there are two ways to study behavior. One method is to measure behavior directly and the other is to measure behavior indirectly, mostly using behavioral intention. Behavioral intentions according to TPB (Icek, 1991) is a factor that are able to measure how much effort a person willing to dedicate to perform a behavior and that it is the most influential predictor of someone behavior. Three types of belief impacts three behavioural perceptions, respectively, behavioural beliefs influence attitudes toward behaviour, normative belief determines the subjective norm, and control belief shape perceived behavioral control. As a result, attitudes toward behavior, subjective norm, and perceived behavioral control together lead to the formation of a behavioral intention that in turn determines behavior and outcomes (Ajzen, 1991). Learning outcomes is measured by how well students understand about business processes and how to use ERP SAP software. Learning outcomes can be measured with direct assesment

such as students' exam grades and/or indirect assessment method such as self-reported assessment (Anderson, Benamati, Merhout, & Rajkumar, 2010). In this variable, the perceived learning outcomes measured by self-reported learning outcomes. When student had more behavioural intention using ERPSim, they have a stronger intention to perform the behavior and increasing perceived learning outcome in using ERPSim as a tool to learn business process and ERP SAP software. Accordingly, the following hypothesis is proposed:

H4: Behavioral Intention to Use ERPSim Has a Positive Effect on Perceived Learning Outcomes

### **Behavioral Intention vs Learning Outcome Grading**

Alshare & Lane (2011) dan Carswell & Venkatesh (2002) explain that TPB is used to learn behavior and learning outcomes. Learning outcomes is measured by how well students understand about business processes and how to use ERP SAP software. Learning outcomes can be measured with direct assessment such as student's exam grades and/or indirect assessment method such as self-reported assessment (Anderson, Benamati, Merhout, & Rajkumar, 2010). In this variable, the learning outcomes measured by student's exam grade. When student had more behavioural intention using ERPSim, they have a stronger intention to perform the behavior and increasing learning outcome grading ERP course. Accordingly, the following hypothesis is proposed:

H5: Behavioral Intention to Use ERPSim Has a Positive Effect on Learning Outcome Grading

## **Research Model**

### **Population and Sample**

Population in this research are students that finish their ERP course and had played ERPSim in Accounting Study Program, Faculty of Economic UII. The data collection method was purposive sampling. Primary data were data obtained from the first source, in the form of filling out questionnaires with specific objectives according to the samples needed in this study, i.e. 109 samples. The correlation among various variables was analysed using Structural Equation Modelling (SEM) statistical test approach. SEM approach is a set of statistical techniques that allow simultaneous testing of a series of relatively complex relationships. According to Ghozali & Latan (2015), a path analysis model of all latent variables in PLS consists of three relationships:

1. Inner model which specifies the relation between latent variables (Structural model).
2. Outer model which specifies the relation between latent variables with indicator or manifest variables (Measurement Model).
3. Weight relation in which the score of latent variables can be estimated.

### **Dependent Variable**

#### **Perceived Learning Outcomes**

Perceived learning outcomes are used to know the extent to which a person can understand learning materials after playing ERPSim. Perceived learning outcomes after using ERPSim are measured using five questions adapted from Chen, Keys, and Gaber (2015) using six likert scale.

#### **Learning Outcome Grading**

In Universitas Islam Indonesia Grading is set based on the Decree of the Chancellor of Universitas Islam Indonesia Number 345/SK.rek/BAAK/VIII/2002, grading in every course is set in alphabet. This research will set the score into six likert scale there are:

A- to A	: 6
B+ to A/B	: 5
B- to B	: 4
C+ to B/C	: 3
C/D to C	: 2
E to D	: 1

## Independent Variable

### Enjoyment in Using ERPSim

Enjoyment according to Venkatesh (2000) is the degree to which performing an activity is perceived as providing pleasure and joy in its own right, aside from performance consequences. Because of that enjoyment can be refer as a enjoy experience when someone interact with technology. In this research, the variable of enjoyment in using ERPSim was measured using four questions adapted from Chen et al., (2015) consisting of six likert scale.

### Cognitive Appraisal in Using ERPSim

Cognitive appraisal is cognitive process that follow by behavioral outcomes adopted after the appraisal (Lazarus & Folkman, 1984). Cognitive appraisal is referred to individual interpretation and appraisal of situation in which someone are involved. In this research, the variable of cognitive appraisal in using ERPSim was measured using five questions adapted from Chen et al., (2015) consisting of six likert scale.

### Behavioral Intention to Use ERPSim

Behavioral intentions according to TPB (Icek, 1991) is a factors that are able to measure how much effort a person willing to dedicate to perform a behavior and that it is the most influential predictor of someone behavior.

Behavioral intentions itself influence by three beliefs there are behavioral beliefs influence attitudes toward behavior, normative belief determines the subjective norm, and control belief shape perceived behavioral control. As a result, attitudes toward behavior, subjective norm, and perceived behavioral control together lead to the formation of a behavioral intention that in turn determines behavior and outcomes (Ajzen, 1991). In this research, the variable of behavioral intention to use ERPSim was measured using three questions adapted from Chen et al., (2015) consisting of six likert scale.

## Results and Discussion

### Data Collection Results

In this research, respondents is students which had finished their ERP-SAP course and had played ERPSim in UII's Accounting Study Program. A total of 132 questionnaires were collected from students in 2016's cohort.

**Table 1.** Data Collection Results

Description	Number	Percentage
Questionnaire Collected	132	100 %
Questionnaire That Cannot Be Used	23	17.42 %
Questionnaires That Met The Requirements	109	82.58 %

Source: primary data, 2019

Based on Table 1, it can be seen that from 132 questionnaire collected only 109 questionnaires that met the requirements. The remaining 23 cannot be used because there are two respondents that submit more than once and 21 respondents was never play ERPSim before.

### Respondent Characteristic

Based on the questionnaires that met the requirements, the respondent characteristic by gender is presented in Table 2.

**Table 2.** Respondent Characteristics by Gender

Gender	Number	Percentage
Man	40	36.70 %
Female	69	63.30 %
Total	109	100 %

Source: primary data, 2019

### Distribution of ERP Course Grading

Based on the questionnaires that met the requirements, the respondent's ERP Course Grading is presented in Table 3.

**Table 3.** Distribution of ERP Course Grading

Students Score	Number	Percentage
A- to A	89	81.65%
B+ to A/B	13	11.93%
B- to B	4	3.67%
C+ to B/C	3	2.75%
Total	109	100 %

Source: primary data, 2019

### Validity Test

In this research validity test is conducted with the convergence test. Where the result are measure using loading value and AVE. The variable is valid if the result of loading and AVE value are more than 0.5. The result of loading value is presented in Table 4 and AVE value will be presented in Table 5.

**Table 4.** Loading Value

Construct	Item	Loading Value
Enjoyment (E)	E 1	0.797
	E 2	0.954
	E 3	0.945
	E 4	0.898
Cognitive Appraisal (CA)	CA 1	0.836
	CA 2	0.837
	CA 3	0.824
	CA 4	0.763
Behavioral Intention (BI)	BI 1	0.900
	BI 2	0.872
	BI 3	0.948
Perceived Learning Outcomes (PLO)	PLO 1	0.699
	PLO 2	0.786
	PLO 3	0.677
	PLO 4	0.656
	PLO 5	0.774
Learning Outcome Grading (LOG)	LOG	1.000

Source: primary data, 2019

Base on table 4 and 5, it can be seen that all items have a loading and AVE value above 0.5.

**Table 5.** AVE Value

Construct	AVE Value
Enjoyment (E)	0.811
Cognitive Appraisal (CA)	0.665
Behavioral Intention (BI)	0.823
Perceived Learning Outcomes (PLO)	0.519
Learning Outcome Grading (LOG)	1.000

Source: primary data, 2019

Base on the result in table 4 and 5, it can be concluded that this study has met the validity test.

### Reliability Test

The reliability test was done by using composite reliability and cronbach's  $\alpha$  values. The variable is reliable if the result of composite reliability and cronbach's  $\alpha$  values are more than 0.7. The result of composite reliability and cronbach's  $\alpha$  value is presented in Table 6.

**Table 6.** Composite Reliability and Cronbach's A Value

Construct	Composite Reliability	Cronbach's $\alpha$
Enjoyment (E)	0.945	0.921
Cognitive Appraisal (CA)	0.888	0.832
Behavioral Intention (BI)	0.933	0.893
Perceived Learning Outcomes (PLO)	0.843	0.767
Learning Outcome Grading (LOG)	1.000	1.000

Source: primary data, 2019

Base on table 6, it can be seen that all items have a Composite Reliability and Cronbach's  $\alpha$  value above 0.7. This way, it can be concluded that this study has met the reliability test, making it reliable.

### R-Square ( $R^2$ ) Test

R-square test was conducted to see the extent of the effect of the independent variables on the dependent variable in the study. The results of the R-square hypothesis test in this study can be seen in Table 7.

**Table 7.** R-Square Value

Cognitive Appraisal (CA)	0.197
Behavioral Intention (BI)	0.536
Perceived Learning Outcomes (PLO)	0.233
Learning Outcome Grading (LOG)	0.006

Source: primary data, 2019

Based on Table 7, it can be seen that the variable cognitive appraisal (CA) has r-square values are 0.197. This means that the variable of enjoyment (E) has an effect on the variable of cognitive appraisal (CA) of 19.7%. Variable behavioral intention (BI) has r-square values are 0.536. This means that the variable of enjoyment (E) and cognitive Appraisal (CA) has an effect on the variable of behavioral intention (BI) of 53.6%. Variable perceived learning outcomes (PLO) has r-square values are 0.233. This means that the variable of behavioral intention (BI) has an effect on the variable of perceived learning outcomes (PLO) of 23.3%. Variable learning outcome grading (LOG) has r-square values are 0.197. This means that the variable of behavioral intention (BI) has an effect on the variable of learning outcome grading (LOG) of 0.6%. If a variable has r-square near to 1, it means that the variable explain very well about the effect of the independent variables on the dependent variable in the study.



## Hypothesis Test

Hypothesis was test using multiple regression analysis with Smart PLS 3.0 M3. In this research hypothesis was proven or not using path coefficients test. The path coefficients test was done by using original sample and p-values. The hypothesis is proven if the result of original sample is positive and the value of p-values is less than level of significance, where the level of significance is  $\alpha = 0.05$ . The result of path coefficients test is presented in Table 8.

**Table 8.** The Result of Path Coefficients

	Original Sample	P Values
Enjoyment > Cognitive Appraisal	0.444	0.000
Cognitive Appraisal > Behavioral Intention	0.362	0.000
Enjoyment > Behavioral Intention	0.495	0.000
Behavioral Intention > Perceived Learning Outcomes	0.483	0.000
Behavioral Intention > Learning Outcome Grading	-0.076	0.231

Source: primary data, 2019

### **Enjoyment of Using ERPSim Has a Positive Effect on Cognitive Appraisal of Using ERPSim**

The first hypothesis (H1) testing in this study has proven that enjoyment of using ERPSim has a positive effect on cognitive appraisal of using ERPSim. The variable has original sample value of 0.444 and P value of 0.000 or less than  $\alpha = 0.05$ . These results are correspond with the TPB (Icek, 1991), where enjoyment acting as an intrinsic behavioral belief has a positive influence on an individual's behavioral intention and behavioral performance in a cognitive-psychological activity such as information systems usage (Davis et al., 1992; Venkatesh, 2000). This research found that enjoyment increase cognitive appraisal in using ERPSim. When someone enjoy for doing an activity will affect his emotion which will increase his cognitive appraisal since affective appraisal comes earlier in the human brain than cognitive appraisal. The results of this research are in accordance with Chen et al. (2015) and Setyono & Arnandiansyah (2018).

### **Cognitive Appraisal in Using ERPSim Has a Positive Effect on Behavioral Intention To Use ERPSim**

The second hypothesis (H2) testing in this study has proven that cognitive appraisal of using ERPSim has a positive effect on behavioral intention to use ERPSim. The variable has original sample value of 0.362 and P value of 0.000 or less than  $\alpha = 0.05$ . This research indicates that cognitive appraisal in using ERPSim increasing behavioral intention to use ERPSim. When the students believe that using ERPSim help them learn business concepts and software usage easily and quickly, they have the motivation and inspiration to explore ERPSim and thus it will increasing the intention to use ERPSim. The results of this research are in accordance with Chen et al. (2015) and Setyono & Arnandiansyah (2018). These results are corresponded with Fadel & Brown (2010), Beaudry & Pinsonneault (2005), and Lazarus & Folkman (1984) which found that user's appraisal of information systems affect motivation to use information systems and their behavior.

### **Enjoyment of Using ERPSim Has a Positive Effect on Behavioral Intentions to Use ERPSim**

The third hypothesis (H3) testing in this study has proven that enjoyment of using ERPSim has a positive effect on behavioral intentions to use ERPSim. The variable has original sample value of 0.495 and P value of 0.000 or less than  $\alpha = 0.05$ . These results are correspond with TPB (Icek, 1991), where enjoyment acting as an intrinsic behavioral belief is a positive influence on an individual's behavioral intention and behavioral performance in a cognitive-psychological activity such as information systems usage (Davis et al., 1992; Venkatesh, 2000). This research indicates

that enjoyment of using ERPSim increase behavioral intentions to use ERPSim. Enjoyment experience in using ERPSim will make students underestimate the difficulty of using ERPSim, and increasingly the behavioral intention to use ERPSim for learning business processes. The results of this research are in accordance with Chen et al. (2015) and Setyono & Arnandiansyah (2018).

### **Behavioral Intention to Use ERPsim Has a Positive Effect on Perceived Learning Outcomes**

The fourth hypothesis (H4) testing in this study has proven that behavioral intention to use ERPsim has a positive effect on perceived learning outcomes (learning outcome which measured using self-assessment). The variable has original sample value of 0.483 and P value of 0.000 or less than  $\alpha = 0.05$ . This research indicates that behavioral intention to use ERPsim increasing perceived learning outcomes. When student had more behavioral intention using ERPSim, they have a stronger intention to perform the behavior and increasing perceived learning outcome in using ERPSim as a tool to learn business process and ERP SAP software. The results of this research are in accordance with Chen et al. (2015) and Setyono & Arnandiansyah (2018).

### **Behavioral Intention to Use ERPsim Has a Positive Effect on Learning Outcome Grading**

The fifth hypothesis (H5) testing in this study **has not proven** that behavioral intention to use ERPsim has a positive effect on learning outcome grading. The variable has original sample value of -0.076 and P value of 0.231 or more than  $\alpha = 0.05$ . The insignificant value in learning outcome grading also happened in the research conducted by Anderson et al. (2010) and Moorthy, Munz, Adams, Pandey, & Darzi (2006). The reason why learning outcome grading is not correlate with behavioral intention are first, students are overestimate their ability, so they believe that their ability are sufficient but the truth is not (Anderson et al., 2010). Second, learning outcome that using grading have focused on task performance while learning outcome that using self reported assessment have focused on cognitive abilities (Moorthy et al., 2006). Or third, students already have a high behavioral intention to use ERPsim but he or she unable to develop themselves in ERP-SAP ccourse in short amount of time.

## **Conclusion**

Based on research results & discussion, the conclusions from this reasearch can be drawn as follows:

1. Enjoyment of using ERPSim has a positive effect on cognitive appraisal of using ERPSim.
2. Cognitive appraisal of using ERPSim has a positive effect on behavioral intention to use ERPsim.
3. Enjoyment of using ERPSim has a positive effect on behavioral intentions to use ERPSim.
4. Behavioral intention to use ERPsim has a positive effect on perceived learning outcomes,
5. Behavioral intention to use ERPsim has a negative effect on learning outcome grading. The reason why it can be negative are first, students are overestimate their ability, so they believe that their ability are sufficient but the truth is not (Anderson et al., 2010). Second, learning outcome that using grading have focused on task performance while learning outcome that using self reported assessment have focused on cognitive abilities (Moorthy et al., 2006). Or third, students already have a high behavioral intention to use ERPsim but he or she unable to develop themselves in ERP course in short amount of time.

## **Research Limitations**

In this research there are some limitations that might affect the results of this research:

1. The Sample in this research only base on students that using ERPSim in short amount of time,
2. This study only examines two factors that effected behavioral intention to use ERPsim, which are enjoyment and cognitive appraisal.

## Suggestion

In this research there are some suggestion that can be use for the next research, they are:

1. For the next reserch, it is expected that the reseach will be conduct in longer duration, so it will give a better picture about the effect of using ERPSim in ERP-SAP course,
2. There are many other factors that can determine behavioral intention and learning outcomes of experimenting with ERPSim. To understand student's behavioral intention and learning outcomes, a more comprehensive and integrative research model is required. Such a research model should include a wide range of antecedent factors that come from the Information System education literature. For example, student's concentration, curiosity, innovative attitude, personal skills in Information System Technology and understanding of business processes, etc. all play determinant roles in learning outcomes. Although it is impossible to include all possible factors in one research model, a relatively comprehensive model will be able to investigate interactive effects (i.e., moderating and mediating) of factors on behavioral intention and learning outcomes.
3. The researcher recommend future IS research to be focused on the effectiveness and efficiency of using ERPSim in teaching and learning processes, such as compared the student's learning performance before and after using ERPSim in ERP course. Thus we can investigate the antecedent effects of cognitive-psychological factors on the learning outcomes between an ERPsim group and a non- ERPsim group (control group).

## References

- Acar, M. F., Tarim, M., Zaim, H., Zaim, S., & Delen, D. (2017). Knowledge management and ERP: Complementary or contradictory? *International Journal of Information Management*, 37(6), 703–712. <https://doi.org/10.1016/j.ijinfomgt.2017.05.007>
- Anderson, P., Benamati, J. S., Merhout, J. W., & Rajkumar, T. M. (2010). Are student self-assessments a valid proxy for direct assessments in information systems programs? *16th Americas Conference on Information Systems 2010, AMCIS 2010*, 1(31), 183–191.
- Blunt, R. (2007). Does game-based learning work? Results from three recent studies. *Proceedings of the Interservice/Industry Training, Simulation, & Education Conference*, 1–12. Retrieved from <https://www.reality-xp.com/professional/files/GameBasedLearningStudies.pdf>
- Breckler, S. J. (1984). Empirical validation of affect, behavior, and cognition as distinct components of attitude. *Journal of Personality and Social Psychology*, 47(6), 1191–1205. <https://doi.org/10.1037/0022-3514.47.6.1191>
- Campbell, T. S., Johnson, J. A., & Zernicke, K. A. (2013). Cognitive Appraisal. In *Encyclopedia of Behavioral Medicine* (pp. 442–442). [https://doi.org/10.1007/978-1-4419-1005-9\\_1115](https://doi.org/10.1007/978-1-4419-1005-9_1115)
- Chen, L., Keys, A., & Gaber, D. (2015). How does ERPsim influence students' perceived learning outcomes in an information systems course? An empirical study. *Journal of Information Systems Education*, 26(2), 135–146.
- Cronan, T. P., & Douglas, D. E. (2012). A student erp simulation game: A longitudinal study. *Journal of Computer Information Systems*, 53(1), 3–13.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1992). Extrinsic and Intrinsic Motivation to Use Computers in the Workplace. *Journal of Applied Social Psychology*, 22(14), 1111–1132. <https://doi.org/10.1111/j.1559-1816.1992.tb00945.x>
- Dimiyati, & Mudjiono. (2006). *Belajar dan Pembelajaran*. Jakarta: Rineka Cipta.
- Ernita, H., & Kusuma, W. A. (2008). Pengembangan Enterprise Resource Planning ( Erp ). *Seminar Nasional Informatika 2008 UPN "Veteran" Yogyakarta, 2008(semnasIF)*, 149–156. Yogyakarta: UPN "Veteran" Yogyakarta.

- ERPSimLab. (n.d.). Dynamic, Engaging, Real Learning. Retrieved from ERPSimLab. website: <https://erpsim.hec.ca/en/erpsim>
- Ghozali, H. I., & Latan, H. (2015). *Konsep, Teknik, dan Aplikasi Menggunakan Program SmartPLS 3.0*. Semarang: Badan Penerbit Universitas Diponegoro.
- Hwang, M., & Cruthirds, K. (2017). Impact of an ERP simulation game on online learning. *International Journal of Management Education*, 15(1), 60–66. <https://doi.org/10.1016/j.ijme.2017.01.004>
- Icek, A. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. Retrieved from <http://www.sciencedirect.com/science/article/pii/074959789190020T>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, Appraisal, and Coping*. New York: Springer Publishing Company.
- LeDoux, J. (1995). Emotion: Clues from the Brain. *Annual Review of Psychology*, 46(1), 209–235. <https://doi.org/10.1146/annurev.psych.46.1.209>
- Lee, Y., Chen, A. N. K., & Ilie, V. (2012). Can online wait be managed? The effect of filler interfaces and presentation modes on perceived waiting time online. *MIS Quarterly: Management Information Systems*, 36(2), 1–30.
- Léger, P.-M. (2006). Using a simulation game approach to teach enterprise resource planning concepts. *Journal of Information Systems Education*, 17(4), 441.
- Levant, Y., Coulmont, M., & Sandu, R. (2016). Business simulation as an active learning activity for developing soft skills. *Accounting Education*, 25(4), 368–395. <https://doi.org/10.1080/09639284.2016.1191272>
- Marnewick, C., & Labuschagne, L. (2005). A conceptual model for enterprise resource planning (ERP). *Information Management and Computer Security*, 13(2), 144–155. <https://doi.org/10.1108/09685220510589325>
- Moorthy, K., Munz, Y., Adams, S., Pandey, V., & Darzi, A. (2006). Self-assessment of performance among surgical trainees during simulated procedures in a simulated operating theater. *American Journal of Surgery*, 192(1), 114–118. <https://doi.org/10.1016/j.amjsurg.2005.09.017>
- Mulyasa, E. (2008). Menjadi Guru Profesional Menciptakan Pembelajaran Kreatif Dan Menyenangkan. In *PT. Remaja Rosdakarya*. Bandung: PT. Remaja Rosdakarya.
- Olson, D. L., Johansson, B., & De Carvalho, R. A. (2018). Open source ERP business model framework. *Robotics and Computer-Integrated Manufacturing*, 50(3), 30–36. <https://doi.org/10.1016/j.rcim.2015.09.007>
- Seethamraju, R. (2008). Enhancing student learning of enterprise integration through ERP business simulation game. *AIS SIGed: LAIM - Proceedings of the 2008 International Conference on Informatics Education*, 19–29.
- Venkatesh, V. (2000). Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model. *Information Systems Research*, 11(4), 342–365. <https://doi.org/10.1287/isre.11.4.342.11872>