The Effectiveness of Knowledge Transfer Using Learning Cards Tool Based on Technology Acceptance Model

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THE EFFECTIVENESS OF KNOWLEDGE TRANSFER USING LEARNING CARDS TOOL BASED ON TECHNOLOGY AC-CEPTANCE MODEL

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ABSTRACT Knowledge transfer is the main learning activity in an education institution. The using of tools in learning activity that is not user-friendly becomes one of the factor affecting the effectiveness process. The creative tools usage in learning process is very important as the knowledge transfer strategy. The objective of the research is to identify the main factors that affect the usage of learning card as creative tools in the future knowledge transfer process. In this study, we take the Technology Acceptance Model (TAM) as a basic for measuring the effectiveness of transfering knowledge through learning cards. The questionnaires were distributed to 76 students from two observed classes as the users. The factors analysis and the regression analysis were used to rank significantly influence and identify the factors can affect the variable intention to use the cards for the future.

Keyword: knowledge transfer, learning cards tool, effectiveness, and TAM

1. INTRODUCTION

Nowadays applying technology in the learning process become the trend issue in education. As more teachers adopt information technology to assist instruction, more researchers will investigate the issue of technology-integrated education (I-Fan, et.al. 2010).

In the traditional learning method, the teachers usually guide the course through face-to-face learning. From the effectiveness point of view it could be high impact to achieve the competency. But it could takes more a lot time to implement. So that it can arise inefficient process in the large scale classes.

In the modern learning process, students absorb content of the course from the teachers in the large scale class and interact with peers or through discussions. In general, the teacher plays an authoritative role. It is difficult for us to know whether students are active or passive participants. They may need to complete the work or task assigned by the teacher and get credits after passing the exam. (I-Fan, et.al. 2010). Moreover, it is difficult to make sure that the students really understand or not to the course content. Based on this condition, the researchers develop creative tools for knowledge transfer as a cards learning. The content of cards consist of the organizational business concept. Davis (1986), who proposed the Technology Acceptance Model (TAM), suggested that the ease of use and usefulness of a technology affect users' intention to use it. Therefore, we can predict users' willingness to accept technology based on their perception by using TAM. So that, the purpose of this study is measuring the effectiveness of transfering knowledge through learning cards based on TAM.

2. LITERATURE REVIEW

Davis (1986) proposed the Technology Acceptance Model (TAM) to investigate the impact of technology on user behavior. The model focuses on the process of using technology, where ''Perceived Usefulness'' and ''Perceived Ease of Use'' are the two key factors that affect an individual's intention to use a technology. Perceived Usefulness means that the user believes the technology will improve his/her performance, while Perceived Ease of Use refers to the belief that using the technology will be free of effort. Over the past decade, TAM introduced by Davis (1986) has been applied to understand the attitude IT users holds about the use of a variety of technologies, which is usedto predict the adoption of numerous technologies. Three constructs in TAM, perceived usefulness, perceived ease of use, and attitude toward using the system, explain a user's intention to adopt a new technology. Perceived usefulness and ease of use are behavioral beliefs impacting on attitude which influences intention to use (Wonjin, J and Rok, Y.H. 2015)

Research Model

To develop the measurement models for the usage of learning cards tool, the researcher proposed the conceptual model and hypothesis based on Technology Acceptance Model. Perceived Usefulness and Perceived Ease of Use could be affected by the external variables considered in the original TAM model. In this study, we explore which external variables directly affect student intentions to use a card learning.

1. Perceived Usefulness (PU)

   The important components of TAM, is perceived usefulness which has been used by many information system reseachers. perceived usefulness can be defined as the degree to which a person believes that using a particular system would enhance his or her job performance. In other word, the learning cards has a positif effect on the performance of the students in knowledge transfer. The performance student can be improved by learning cards process. Hence, learning cards has a positif impact to the behavior of the student. Perceived Ease of Use (PEOU) (Sharma & Chandel, 2013).

2. Perceived Ease of Use (PEOU)

   PEOU is defined as the degree to which a person believes that using a particular system would be free of effort. In other words, the student who gets the education, it is expected that they are comfortable with the use of learning cards. It reflects the intention of students towards the usage of learning cards.

3. Cards Interface Design CID)

   The interface design will not facilitate better learning outcomes if it is not comprehensive or it does not meet users needs (Wang & Yang, 2005; Szalma, J. L. 2014). I-Fan, et.al. 2010 suggested that the following five principles of user-centered design should be used to develop a user interface that can promote more interaction between learners and the system. The principles are: (1) make the most important information distinct, (2) establish a visual order of importance for the user, (3) organize information so that learners can see the ''big'' picture, and (4) visual feedback. These design principles have been adopted by a number of researchers and organizations.

4. Behavior Intention to Use

   Many studies show that TAM has a crucial role in studies related to information technology usage by students and demonstrate that the PEOU and PU of technology applications affect students learning efficacy and attitude. In addition, PEOU and PU are important factors that influence whether learners continue learning in the long term PEOU and PU impact not only on attitude, behavior intention, continuance learning, and IT usage but also learning satisfaction. In summary, TAM is an adequate model in predicting student learning card usage and learning satisfaction

In the examining the relationships among the variables above, there are assumptions of correlation among the variables. In this study the researchers proposed the hypothesis that are proposed based on the discussion and the literature review above and the proposed research model is depicted in Figure 1 below.

H1: there is a positive relationship between perceived of usefulness and intention to use.
H2: there is a positive relationship between perceived ease of use and intention to use.
H3: there is a positive relationship between cards interface design and intention to use.

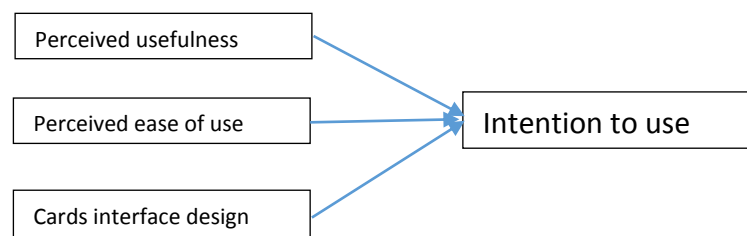Figure 1.   Relationship variables based on technology acceptance model

Research Method

In this research, data were collected by the questionnairs that was designed based on TAM concept. The measurement items taken in this study use five point likert scale from (1) strongly disagree to (5) strongly agree to assess the respondent respon. The questionnair distributed to 76 students as the user of learning

cards in two classes of organizational design and business management subject. The students should give the feedback after learning process. From the table below, it could be described that the percentage of gender participated in the survey was male (52.6%) and female (47.4%).

Table 1. Percentage of Respondent Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	40	52.6	52.6	52.6
	Female	36	47.4	47.4	100.0
	Total	76	100.0	100.0	

After data were collecting, it should be proceed with the validity and reliability test. Based on the relationship model between the independent variables and dependent variable, it can be analyzed and discussed result of the research that derived from data processing. Finally, this study can made some conclusions and suggestions for further research.

The Results of Research

1. Validity and Reliability Analysis

Before the data analysis, the validity test was done to the questionnaire result by pearson correlation formula as below:

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2][n\Sigma y^2 - (\Sigma y)^2]}}$$

Where
r = coefficient correlation
n = sample size or number of subject
x = item score
y = total score

Based on data collecting, all of the count of coefficient correlation (r) more than in table (r count > r table), its mean that all the items of questionnaire have a significant correlation in 0.05 level to the total item score (all items are valid).

Table 2. Validity dan reliability results

No	Variabels	Questionnair Items		Reliability Statistics		Correlation Statistics			
				Cronbach's Alpha	N of Items	Validation (R count > R table)	R count	R table 0.05	R table 0.01
1	Card interface design	1	Card design caught my attention	0.76	7	Valid	0.727	0.220	0.286
		2	The image in learning cards can help me to memorize			Valid	0.792	0.220	0.286
		3	The font size in learning cards is conformity			Valid	0.612	0.220	0.286
		4	The size of learning cards is appropriate to me.			Valid	0.546	0.220	0.286
		5	The meaning of sentences in the learning cards are easy to be understood			Valid	0.562	0.220	0.286
		6	The picture in learning cards makes me happy in learning			Valid	0.657	0.220	0.286
2	Perceived of usefulness	1	Learning sorogan card helped me in learning	0.82	8	Valid	0.627	0.220	0.286
		2	Learning cards can help me to understand the main points of lectures			Valid	0.655	0.220	0.286
		3	The learning cards could allow me to remember the teaching material			Valid	0.533	0.220	0.286
		4	The learning cards is a fun learning tool for me			Valid	0.567	0.220	0.286
		5	The learning cards can increase my enthusiasm in learning process			Valid	0.736	0.220	0.286
		6	The learning cards can increase my academic value			Valid	0.728	0.220	0.286
		7	The learning cards can accelerate me to understand the material			Valid	0.821	0.220	0.286
		8	By learning cards, the scoring system become fairer			Valid	0.673	0.220	0.286
3	Perceived ease of use	1	The learning cards are highly flexible to used in learning activity	0.52	3	Valid	0.700	0.220	0.286
		2	The learning cards usage is very suitable to use in the study group			Valid	0.808	0.220	0.286
		3	By learning cards, I can measure the achievement of learning outcomes easily			Valid	0.627	0.220	0.286
4	Intention to use	1	I think the learning cards can be used in the future continuously	0.60	3	Valid	0.490	0.220	0.286
		2	The learning cards are used by me in study group			Valid	0.835	0.220	0.286
		3	I think learning cards is very effective when done in a group sharing			Valid	0.857	0.220	0.286

In measurement model, the internal consistency item or reliability is being tested by Cronbach's alpha formula as follow:

$$r = rk /[1 + (k -1)r]$$

where :

k = the number of items considered

r = the mean of the inter-item correlations the size of alpha is determined by both the number of items in the scale and the mean inter-item correlations.

From the table above the data shows that all variables have Cronbach's alpha value more than 0.5.

2. Correlation and Regression Analysis

The table 3 shows the correlation among dependent and independent variables. From the pearson correlation the significant value occur between perceived ease of use as an independent variables to intention to use as a dependent variable (r = 0.692, p < 0.05) supports hypothesis 2. The other correlation also occur among independent variables (i.e. between perceived usefulness to ease of use (r = 0.546, p < 0.05), perceived usefulness to cards interface design (r = 0.337, p < 0.05), and cards interface design to perceived ease of use (r = 0.337, p < 0.05)). Based on this results, it could be explained that there are indirect correlations between independent variables (i.e. perceived usefulness and cards interface design) to dependent variable intention to use.

Tabel 3. Correlation coefficients

		Perceived of Usefulness	Intention to use	Perceived ease of use	Card interface design
Perceived of Usefulness	Pearson Correlation	1	0.211	.546**	.337**
	Sig. (2-tailed)		0.067	0.000	0.003
	N	76	76	76	76
Intention to use	Pearson Correlation	0.211	1	.692**	0.133
	Sig. (2-tailed)	0.067		0.000000	0.252
	N	76	76	76	76
Perceived ease of use	Pearson Correlation	.546**	.692**	1	.266*
	Sig. (2-tailed)	0	0		0.02
	N	76	76	76	76
Card interface design	Pearson Correlation	.337**	0.133	.266*	1
	Sig. (2-tailed)	0.003	0.252	0.02	
	N	76	76	76	76

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

From the summary model given in table 4 show that the coefficient correlation (R) for the model i.e. (R= 0.721). Based on Durbin-Watson value for both models is 1.930. So, in this result can be concluded that there is no autocorrelation. From the model, the coefficient of determination are 51.9% which shows that the variation explained in dependent variable due to independent variables.

Table 4. Model Summary(b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.721a	0.519	0.499	1.30723	1.93

a. Predictors: (Constant), Card interface design, Perceived ease of use, Perceived of Usefulness
b. Dependent Variable: Intention to use

The table 5 reports ANOVA where a significant F statistic justifies the appropriateness of the proposed model.

Table 5. ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	132.897	3	44.299	25.923	.000a
	Residual	123.037	72	1.709		
	Total	255.934	75			

a. Predictors: (Constant), Card interface design, Perceived ease of use, Perceived of Usefulness
b. Dependent Variable: Intention to use

The relative order of preference of the predictive factors of student intention to use the learning cards based on the beta values (given in table 6) could be summarized as follows: perceived usefulness (B= -0.237), perceived ease of use (B= 0.823), and cards interface design (B= -0.006). There are two factors statistically significant at 5% level of significance as the p value corresponding to these factors are less than 0.05.

Table 6. Regression analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.147	1.477		2.807	0.006
	Perceived of Usefulness	-0.121	0.051	-0.237	-2.355	0.021
	Perceived ease of use	0.939	0.112	0.823	8.394	0.000
	Card interface design	-0.003	0.051	-0.006	-0.069	0.945

a. Dependent Variable: Intention to use

Discussion of Findings
In this study, we found that there were two independent variables have a significance value i.e. perceived usefulness (sig. 0.021 < 0.05) and perceived ease of use as (sig. 0.000 < 0.05). For this results, we can said that perceived usefulness and ease of use have a positif effect on intention of the students to use the learning cards. Based on standardized coefficients value, it can be interpreted that perceived ease of use (Beta = 0.823) more influence the perception among the students towards the learning cards.

Conclussion
This study analysed the factors that affects the effectiveness knowledge transfer among students through learning cards as a learning tools. Based on the result of the research, it conclude that the

perceived usefulness and perceived ease of use can be a predictors for student behavior and motivation to intent to use the learning cards in knowledge transfer process. The contribution of this study is for validating the previous technology acceptance model combined with the knowledge transfer context to explain and measure the effective learning process. For further research, it could be modified a new framework for TAM model by including factors such as implement another learning method, uniqueness of human characteristics, learning culture, improved cards design, etc.

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Ringkasan Makalah

Penelitian ini bertujuan untuk mengetahui faktor-faktor yang berpengaruh terhadap efektivitas pembelajaran dengan menggunakan metode kartu belajar sebagai sarana transfer pengetahuan. Model TAM (*Technology Acceptance Model*) digunakan sebagai kerangka evaluasi terhadap implementasi proses pembelajaran dengan menggunakan kartu belajar. Berdasarkan studi literature yang dilakukan maka dirumuskan beberapa variable yang digunakan untuk mengukur proses pembelajaran tersebut yaitu *perceived usefulness, perceived ease of use* dan *learning cards interface design*. *Perceived of usefulness* adalah variabel yang mengukur bagaimana pandangan, pemahaman, dan perasaan pihak pengguna tentang kemanfaatan atau tingkat kebermaknaan terhadap penggunaan kartu belajar dalam efektivitas proses transfer pengetahuan. *Perceived ease of use* adalah variabel mengukur bagaimana pandangan, pemahaman, dan perasaan mahasiswa tentang kemudahan terhadap penggunaan kartu belajar sebagai sarana proses transfer pengetahuan. *Learning cards interface design* adalah variabel yang mengukur bagaimana pendapat pengguna kartu belajar tentang rancangan *layout* atau tat letak atau susunan dari isi kartu yang terdiri atas aspek visual, konseptual dan tekstual. *Intention to use* adalah variabel yang mengukur sikap pihak pengguna terhadap kemungkinan penggunaan kartu sebagai media dalam proses pembelajaran. secara berkesinambungan. Berdasarkan proses penelitian yang telah dilakukan terdapat beberapa hasil yang diperoleh yaitu terdapat hubungan dan pengaruh dari variabel *perceived usefulness* dan *perceived ease of use* terhadap kemungkinan penggunaan kartu dimasa yang akan datang sebagai sarana pembelajaran yang efektif.