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Emerging Technologies Acceptance in Online Tutorials: Tutors' and Students' Behavior Intentions in Higher Education

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Abstract

Tutors' and students' intentions to use emerging technologies (ETs) in e-learning systems in higher education institutions are a central concern of researchers, academicians, and practitioners. However, tutors' and students' intentions to use ETs in e-learning systems in distance learning are relatively low. The goal of the study, developed in Universitas Terbuka, was to investigate the factors that may affect tutors' and students' intentions to use ETs in online tutorials.

A Web-based survey was designed to empirically assess the effect of the aforementioned constructs on tutors' and students' intentions to use ETs in online tutorials. The statistical analysis results showed that the theoretical model was able to predict instructors' and students' intention to use ETs in online tutorials. However, not all three independent variables showed significant relationships with the dependent variable. Results of MLR analysis was consistent on technology competencies (TC) as having the greatest weight on predicting instructors' and students' intentions to use ETs.

Keywords: emerging technologies; online tutorial; technology acceptance model

Introduction

The incorporation of emerging technologies (ETs) in education is an acknowledgement of the profound influence technology has on all aspects of human life, and there is a critical need for all individuals to develop at least minimal levels of understanding of technology and what it means for their lives (Custer, 1995). ETs and their potential to foster unique types of learning have become a special issue in the last two years. ETs refer to tools, concepts, innovations, and advancements that are utilized in diverse educational settings to serve varied educational purposes, and that can be described as evolving organisms existing in a state of "coming into being" (Veletsianos, 2010).

The development of sophisticated computers and technology in general has changed the essence of distance learning delivery. The programs mentioned in the developing countries, particularly in Indonesia, are intended to ease the shortage of teachers. These programs have been around for more than 25 years in the Open University of Indonesia (*Universitas Terbuka*/UT). *Universitas Terbuka* (UT) is a 45th state university in Indonesia which provides distance learning, particularly for in-service teachers, workers, and fresh high school graduates (Zuhairi, Wahyono & Suratinah, 2006). UT was established in September 4, 1984 as a one of the Indonesian Government's national strategies to improve participation in higher education. In 2012, UT enrolls more than 650.000 students, residing in different parts of the country; most of them are working adults.

UT has the challenge to provide educational quality excellence at a distance for students who have different levels of economic capacity, access to information and communication technology (ICT) facilities and limited ICT literacy (Zuhairi, Adnan & Thaib, 2007). Therefore, UT provides online services to support students' learning. The services include online counselling, online tutorials and, more recently, an online examination system. According to Zuhairi *et al*. (2007) the provision of learning support systems is crucial in making students successful in distance learning.

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This research explores tutors' and students' behavioral intentions as factors affecting their use of emerging technologies in their distance learning and how these behavioral intentions reflect changes in their educational beliefs and actual learning practice. It is believed that teachers are the important persons in changing the educational world, particularly in the learning and teaching processes. On the other hand, students might perceive the value of emerging technologies for improved learning differently and fail to understand the role of technology in transforming their courses (Bessier, Kurt & Reinhart, 1997).

The specific research questions addressed were:

1. To what extent does emerging technologies reaction (ETsR), emerging technologies understanding (ETsU) and technology competencies (TC) contribute to tutors' and students' intention (behavioral intention—BI) to use emerging technologies in online tutorial?
2. Which construct out of the three independent variables (ETsR, ETsU, or TC) provides the most significant contribution to tutors' and students' intention to use emerging technologies in online tutorial?

The main goal of this study is to empirically investigate the contribution of tutors' and students' ETsR, ETsU, and TC to their intention to use emerging technologies in distance learning, as measured by the weight of their contributions to the prediction of BI. A secondary, but related purpose of this study is to identify, from the tutor's and student's perspective, the key factors that encourage or inhibit tutors and students to embrace emerging technologies in online tutorial. Thus, the relevance for the current study was that it investigated factors that contribute to tutors' and students' acceptance of emerging technologies that has been developed specifically to respond to current demands of open and distance learning.

This investigation may make a useful contribution to the growth and development of strategies that might help higher education institutions introduce online education programs that speak to the specific needs and interactions of their teachers and students. Thus, the significance of the current study lies in investigating key constructs that are contributing to tutors' and students' intentions to use emerging technologies in distance learning. As a result of the information provided by these findings, tutors and students in higher education institutions will be able to accommodate emerging technologies into curriculum reform to embrace distance education as a valid delivery method. Furthermore, the appropriate emerging technologies will be refined and developed to support tutors and students training programs as a result of the findings of this study. The findings of this study could also be used in broader studies focused on the instructional emerging technologies that integrate ICT into learning support materials for designing effective distance learning process.

Literature Review

Theoretical Foundation

The objective of this study is to uncover the important factors affecting the tutors' and students' behavioral intention (BI) to use emerging technologies (figure 1). In order to provide a solid theoretical basis for examining the important antecedents for ETs usage, this study integrates the classification of technology competence levels from Tomei (2005), learning and training evaluation theory (Kirkpatrick, 1998) and two important streams of literature under the structure of the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975): the technology acceptance model (TAM) (Davis, 1989; Davis, Bagozzi & Warshaw, 1989) and the theory of planned behavior (TPB) (Ajzen, 1991). It also uses the diffusion of innovations theory (Rogers, 1995).

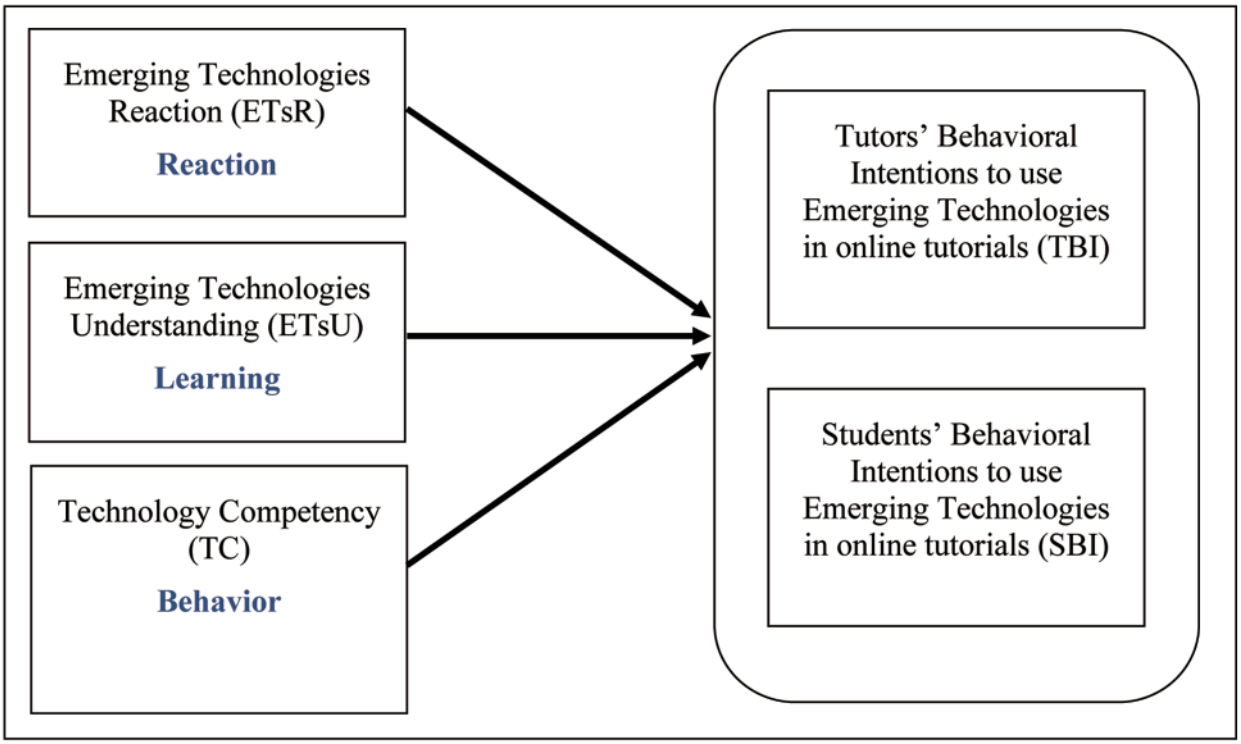

Figure 1: The Conceptual Research Map

Integrating technology into the learning process encompasses more than teaching basic computer literacy or using technology for collaboration and decision-making. Lawrence Tomei (2005) developed a classification for technology levels to correspond with the taxonomy levels of Bloom's taxonomy. Tomei includes six progressive levels for classification of objectives, and includes specific verbs to activate thinking and learning at each level:

(1) Literacy: this level is the minimum degree of competency expected of teachers and students with respect to technology, computers, educational program, office productivity software, the Internet, and their synergistic effectiveness as a learning strategy;
(2) Collaboration: learners are able to employ technology for effective interpersonal interaction such as word processing, desktop publishing, email, and newsgroups;
(3) Decision-making: helps the learners to use technology in a new and concrete situation to analyze, assess and judge via technology through spreadsheets, brainstorming software;
(4) Infusion: learners analyze available technology, and identify, harvest, and apply technology to learning strategies;
(5) Integration: learners create new technology-based learning material; and
(6) Tech-ology: learners are able to appraise, argue, judge, assess, compare, and defend the universal impact, shared values, and social implications of technology and its influence on teaching and learning.

This study explores issues and concerns relating to the pedagogical uses of certain emerging technologies for learning across the curriculum—particularly distance learning. Within the classification of technology domain proposed by Tomei's taxonomy and the technology acceptance evaluation model proposed by Kirkpatrick (1998), there is a need of a paradigm shift beyond the acquisition of tools (i.e., literacy), their use for communication (i.e., collaboration) and decision-making if tutors

and students want to get the benefit of a greater access to technology. A review of the literature has suggested that the integration of technology into teaching and learning is typically affected by the following four factors: teachers' technology skills, teachers' technology beliefs, teachers' perceived technology barriers (Hew & Brush, 2007) and "authentic experiences" (Brush & Saye, 2009).

Kirkpatrick's model provides a strong basis for examining factors that contribute to users' (teachers and students) acceptance of technology. Kirkpatrick's model represents a sequence in which technology acceptance can be evaluated. A meta-analysis by Alliger, Tannenbaum, Bennet, Traver and Shotland (1997) examines the results of 34 studies that yielded 115 correlations among the four levels of training evaluation. The researchers augmented Kirkpatrick's model by further dividing reactions into affective reactions and utility judgments. Affective reactions reflect how much the trainees liked or enjoyed the training. Utility judgments reflect the perceived usefulness of the training. Utility reactions had a significant correlation with learning (r=0.26). Reaction measures that combined affective and utility measure also correlated significantly with learning (r=0.14). The way in which Kirkpatrick (1998) and Alliger *et al*. (1997) perceive the learning process will be used in this study.

Kirkpatrick and Kirkpatrick (2006) describe the four levels of learning in their evaluation model as representative of a sequence of ways to evaluate instruction and learning support material. Kirkpatrick suggests that with each progressive level, evaluation becomes more difficult, but more useful information is obtained (Kirkpatrick, 1998).

Level 1: *Reaction*. Reaction may be defined as how well learners like instruction and instructional material or parts thereof. According to Kirkpatrick and Kirkpatrick (2006) learners' initial reaction to instruction will influence the quality and quantity of learning that takes place. Kirkpatrick (1998) emphasizes that a positive reaction may not guarantee learning, but a negative one will almost certainly preclude it. How much they enjoy it, and how easy and understandable they find it, will be reflected in affective expressions of general satisfaction (Alliger *et al*., 1997), which will cultivate a positive attitude towards instructional material.

Level 2: *Learning*. Kirkpatrick considers learning as change on an intellectual level, namely increasing knowledge, developing or improving skills and changing attitudes (Kirkpatrick, 1998). Alliger and Janak (1989, p. 331) defined level 2 as "principles, facts, and techniques understood and absorbed by the trainees." According to Kirkpatrick no change in behavior will occur without learning. Learning can also refer to which principles, facts, elements and techniques were understood and absorbed by learners (Clementz, 2002).

Level 3: *Behavior*. It is regarded as the extent to which change in behavior has occurred because the participants attended the training program (Kirkpatrick & Kirkpatrick, 2006). True learning can be considered to have taken place when knowledge and skills learned in one domain are applied in another situation (Osman & Hannafin, 1992). The implication is thus that change in behavior is constituted by demonstrated transfer and application of knowledge, skills and attitudes in new situations (Kirkpatrick, 1998). According to Kirkpatrick, behavior cannot be changed unless learners' have had the opportunity to demonstrate it. He also claimed that it is impossible to predict when a change in behavior will occur. Change can take place at any time, ranging from immediately after the intervention to a situation where it may never happen. However, behavior can only be changed if transfer of knowledge has taken place (Kirkpatrick, 1998). To assess this level, an evaluator must determine whether participants' new knowledge, skills, or attitudes transfer to the job or another situation, such as a subsequent course.

Level 4: *Result*. It refers to the achievement of goals of training in terms of reduced costs, higher quality, increased production and lower rates of employee turnover and absenteeism. It is not possible to evaluate "results" as it is difficult to measure and is hard to separate from another variable. The fourth level could refer to assessing how students perform on the job after graduation.

As such, the first two levels are the most often examined by trainers and researchers because they are more immediate and are often easier to measure. Therefore, this study will focus on exploring the utility of the reaction and learning measure, and the third level will also be examined to get better and detail evaluation. Due to time limitations, level 4 will not be investigated.

In TAM, behavioral intention is determined by attitude towards usage as well as by the direct and indirect effects of two system features: perceived usefulness and perceived ease of use (Davis, 1989, 1993). The value of TAM in technology-adoption research has been consistently important and widely accepted (Szajna, 1996; Venkatesh & Davis, 2000). However, as E. M. Rogers (1995) argues, diffusion of innovative technology is highly related to communication channels, individuals, organizational members, and social system in addition to the technology itself. It is clear that technology acceptance could only be partially explained by TAM since both human and social factors should also be incorporated and considered simultaneously (Chen, Fan, & Farn, 2007). Therefore, together with TAM, TPB is selected to provide a necessary theoretical premise for the research model examined in this study.

Technology Acceptance

a) The first factor identified in the literature as a possible contributor to intention to use technology was *emerging technologies reaction* (ETsR). The term of "emerging technologies reactions" is created to define specific perceptions and attitudes on emerging technologies. In this study, I assume emerging technologies reactions as somebody's instant response to emerging technologies during the learning process. The responses can be negative, positive or neutral. This concept is similar to technology perceived enjoyment, which is defined as the degree to which the activity of using technology is perceived to be enjoyable in its own right apart from any performance consequences that may be anticipated (Davis, Bagozzi & Warshaw, 1992). Within the framework of the TAM, they recommended that perceived enjoyment is similar to intrinsic motivation which drives the performance of an activity that is not linked for any reason other than the process of performing the activity per se, whereas extrinsic motivation refers to "the performance of an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself" (p. 1112). They found that usefulness and enjoyment were significant determinants of behavioral intention.

According to Alliger *et al*. (1997) to assess "reactions" is to ask users how they liked and felt about training. In addition, reactions were emotionally based opinions or instant response. Alliger and Janak (1989) suggested that reaction measures that directly ask users about the transferability or utility of the training should be more closely related to other criteria than would reactions measures that ask about "liking." Alliger *et al.* (1997) have broken reactions into two basic components, affective and utility reactions and they also combined these components into third component. The first component, reactions as affect, referred to liking of using emerging technology. For example, "I found this emerging technology to be enjoyable" is a typical reaction item. The second component, reactions as utility judgments, attempted to ascertain the perceived utility value or usefulness. It is made operational by asking such questions as "To what degree will this emerging technology influence your ability later to perform your job?"

According to the literatures, although researchers have generally agreed that ETsR plays an important role in technology acceptance among tutors and students, research results have generally

been mixed and additional research as it relates to acceptance of online learning systems is needed (Fuller, Vician & Brown, 2006; Saadè & Kira, 2006). ETsR has also been identified a stumbling block for instructors in integrating emerging technologies into education programs and, according to Yang, Mohamed and Beyerbach (1999), ETsR was one of the main reasons for limited instructor technology acceptance. In addition, many studies have been conducted to assess the factors that influence instructors' acceptance of emerging technologies (Ball & Levy, 2009; Brill & Galloway, 2007; Bruess, 2003; Kamla Ali & Hafedh, 2010; Oncu, Delialioglu & Brown, 2008). Although research to investigate the students' intention to use technology has been accomplished (Bhrommalee, 2011; Edmunds, Thorpe & Conole, 2012; Luan & Teo, 2011; McCaslin, 2009; Popescu, 2010; Pynoo, Devolder, Tondeur, Braak, Duyck & Duyck, 2011; Teo, Luan, Thammetar & Chattiwat, 2011), further investigation is needed to reveal the ETsR on students' intention to use ETs in online environment. Thus, the contribution of ETsR to instructors' and students' intention to use ETs in online tutorial is important as an area of investigation.

b) The second factor identified in the literature as a possible contributor to intention to use technology was *emerging technologies understanding* (ETsU). Emerging technologies understanding is a component of learning that is indexed by results of traditional tests of declarative knowledge. Alliger *et al*. (1997) incorporated three subcategories of learning: knowledge that is assessed immediately after training, knowledge that is assessed at a later time, and behavior demonstration assessed immediately after training. This study only used the first and second category. Immediate post-training knowledge is usually assessed by multiple choice test responses, answers to open-ended questions, listings of facts and so forth. Knowledge retention is assessed at a later time rather than immediately after training (Alliger *et al*., 1997). Emerging technologies understanding in this study is also assumed as the way users of ETs understand and enhance their knowledge of ETs in educational contexts. My study refers to self-efficacy with regard to ETs—the confidence shown by tutors and students in their own ability to utilize these ETs in online tutorials—which possibly influences perceived ease of use and acceptance of ETs.

Research generally suggested that ETsU was a significant direct and indirect contributor to individuals' intention to use technology (Agarwal & Karahanna, 2000; Compeau, Higgins & Huff, 1999; Compeau & Higgins, 1995; Havelka, 2003). Thus, the contribution of ETsU to instructors' and students' intention to use ETs in online tutorial is crucial as an area of investigation.

c) The third factor identified in the literature as a possible contributor to intention to use technology was *technology competencies* (TC). This study uses the term of technology competencies (TC) to describe the user's experience with, ability to select and apply, and capacity to explore information and communication technology (ICT), especially with computers, to solve problems. There are several ways in which computer experience can be defined and conceptualized. In general, computer experience can be considered to be an act where users engage in applications that are often centered on computers. In addition, computer experience also can be defined in two different ways: as perceived use and variety of use. "While perceived usage refers to the amount of time spent interacting with a microcomputer and [the] frequency of use, variety of use refers to the importance of use and the collection of software packages use" (Igbaria, Guimaraes & Davis, 1995, p. 109). Essentially, the computer would often be a tool for wider and more diverse use. Users are increasingly using computers for information retrieval, data analysis, programming, word processing, creating graphics, and communicating using electronic mail or online conferencing.

Technology competencies also incorporated transferability to emphasize the on-the-job skill performance. According to Alliger *et al*. (1997) a measure was classified as "transfer" whenever it appeared that the measure was not only taken some time after training, but that it was in fact some

measurable aspect of job performance. For example; work samples, work outputs, and outcomes. Behavior that was retained and applied to the workplace was considered transfer (Alliger *et al*., 1997).

There was a consensus among researchers that technology competencies (TC) played a significant role in technology acceptance (Taylor & Todd, 1995; Thompson, Compeau & Higgins, 2006; Venkatesh, Morris, Davis & Davis, 2003). Thus, this study investigated the contribution of TC to instructors' and students' intention to use ETs in online tutorial.

Behavioral Intention (BI) is a measure of the strength of one's intention to perform a specified behavior (Fishbein & Ajzen, 1975). A motivational perspective has also been widely used to understand individual behaviour. It can be defined as the degree to which people believe that using a particular system would enhance their job. In more wide definition, motivation can be described as the force which propels us in anticipation of intrinsic or extrinsic rewards of benefits. Davis *et al*. (1992) found that intrinsic motivation (enjoyment) and extrinsic motivation (usefulness) were key drivers of behavioral intention to use computers. The intrinsic motivation factor (enjoyment) not only had a positive effect on the extrinsic motivation factor (usefulness), it also had a positive effect on the intention to use information technology (Atkinson & Kydd, 1997; Venkatesh, 1999).

Methodology

In order to address the specific research questions noted above, an online survey instrument was adapted from the Brush, Glazewski and Hew (2008) instrument to measure pre-service teachers' technology skills, technology beliefs, and technology barriers. The instrument was modified to accommodate the evaluation model of Alliger *et al*. (1997) and Kirkpatrick (1998), translated into the Indonesian language to provide clear understanding to respondents, and then provided in an online form. In addition, the instrument was evaluated in terms of reliability and validity. The open-ended questions were embedded in the online form to investigate ETs' barriers and challenges in online tutorial. Behavior Intention (BI) was measured using the instrument developed by Chen *et al.* (2007) and Ball and Levy (2009). A Web-based survey was designed to empirically assess the effect of the aforementioned constructs on tutors' and students' intentions to use ETs in online tutorials. The web-based survey was developed as a multi-item measure using Likert-type scales. Existing validated scales were used to develop the web-based survey.

The study was developed on February 2013. The target population of this study was tutors and students of the Open University of Indonesia (Universitas Terbuka-UT). This constituted 436 tutor participants and 3,385 student's participants from all of the study program in UT. They were chosen among the population based on the geographic area, the urban and rural areas. Simple random sampling was used as a type of sampling. I collected 159 responses from tutors (126 fully completed), representing a response rate of approximately 36.5% and I collected 1,734 responses from students (1,201 fully completed), representing a response rate of approximately 51.2%. To provide useful and accurate answers to the research questions, the sample used must be representative of the population (Sekaran, 2003). In order to determine the representativeness of the sample, demographic data were requested from the survey participants. The population of all instructors who participated in online tutorial in 2012.1 academic years at the UT consisted of approximately 54.5% males and 45.5% females. The respondents in the final data set were approximately 46% male and 54% female. Similar to the data distribution of tutors, the distribution of the student data collected appears to be representative of the population of students at UT. The population of non-teacher training students at UT consisted of approximately 51.6% males and 48.4% females. The respondents in the final data set were approximately 59.2% male and 40.8%

female. More than eighty-six percent of the population of non-teacher training students at the university were 40 years of age or younger, with 52.5% of the potential participants between the ages of 17–28. Eighty-eight percent of the respondents in the final data set were 40 years of age or younger, with 54% of the population of non-teacher training students at the university between the ages of 17–28. The distribution of the data collected appears to be representative of the population of instructors at the university.

Multiple Linear Regression (MLR) statistical analysis was used to formulate models and test predictive power. A 95% confidence interval was used in statistical analysis. SPSS 19 was employed to analyze the data in this study. ETsR, ETsU, and TC were dependent variable and BI was independent variable.

Results And Discussions

Technology Skills Analysis

Specific technology skills have been identified as a major factor affecting technology acceptance. The tutors in this study in general had high technology skills in communication and information retrieval, but low technology skills in creation. They felt most comfortable using communication and information retrieval technology. They also were fairly confident in their mastery of basic emerging technology operations.

The results from student data are similar to the data from tutors. Students had high technology skills in communication and information retrieval, but low technology skills in creation. They felt least comfortable with the skills associated with creation technology. In addition, more complex technology skills were self-rated lower by student than simple technology skills.

Perceived Technology Barriers

Access to technology involves providing the proper amount and right types of technology in locations where tutors and students can use them appropriately (Fabry & Higgs, 1998). The tutors and students reported similar perceived technology barriers that suggest that the lack of knowledge about technology and the lack of knowledge about ways to integrate technology into the curriculum are the biggest barriers to use technology in online tutorial.

Predictors of Behavior Intention Using Multiple Linier Regression (MLR)

Multiple Linear Regression (MLR) was used to develop a predictive model to measure the contribution of ETsR, ETsU, and TC to instructors' and students' intention to use emerging educational technology in distance learning, as measured by the weight of the combined contribution of the three independent variables to the prediction of BI. In order to perform the MLR analysis, an aggregated measure for each construct was created for ETsR, ETsU, TC, and BI. MLR was then performed using these measures. Four methods of selection—enter, backward, forward and stepwise—were used to analyze multiple linear regressions. The overall model for predicting tutor behavior intentions from the three predictors (ETsR, ETsU, and TC) was found to be significant with $F(3,125) = 23.489$ ($p < 0.05$). Results indicated that only one of the three individual predictors (TC) was significant ($p < 0.05$), with a positive regression weight, indicating that BI increased as scores on TC increased. In addition, the positive regression weights for ETsR and ETsU indicated that higher scores on ETsR and higher scores on ETsU both indicated higher scores on BI; however, neither of these two independent variables were significant predictors of BI. The MLR coefficients are shown in Table 1. The proportion of the variance in BI that was explained by CSE, CA, and

Table 1. MLR Coefficients

Tutor								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.308	.752		3.067	.003		
	ETsR	.061	.035	.222	1.760	.081	.327	3.053
	ETsU	.048	.028	.188	1.701	.091	.423	2.362
	TC	.062	.030	.255	2.109	.037	.355	2.817
Student								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.821	.228		12.356	.000		
	ETsR	.062	.011	.242	5.815	.000	.315	3.179
	ETsU	.007	.009	.031	.838	.402	.398	2.511
	TC	.087	.010	.357	8.981	.000	.343	2.914

EUT in combination was adjusted $R^2 = 0.351$, or 35.1%. The overall model summary is shown in Table 2.

The weak influence of ETsR on BI for tutors could be due to the fact that tutors are urged to use the ETs in online tutorials; hence perceptions of usefulness are influenced by the institution. It appeared that greater positive reaction to emerging technologies among the students in online tutorials also fostered higher negative reaction in their tutors. Christensen (2002) found that instructor computer anxiety (CA) tended to increase along with the level of technological skill of students. Results also suggested that greater levels of perceived importance of computers in students fostered higher levels of CA in instructors. The finding implies that tutors need some training to reduce their negative reaction more rapidly than the advancing skill level of their students.

Results demonstrated that ETsU was not a significant predictor of behavior intention. The findings on ETsU did not represent the main strength and further did not validate the findings of other researchers—such as Compeau and Higgins (1995); Igbaria and Iivari (1995); Hu, Clark and Ma (2003); Gong, Xu and Yu (2005), and R. Thompson *et al*. (2006)—that computer self efficacy (CSE) is an important contributing factor in predicting behavior intention as it relates to technology usage. In addition, Holden and Rada (2011) found technology self-efficacy (TSE) was more beneficial to the TAM than their computer self-efficacy (CSE).

The overall model for predicting student behavior intention from the three predictors (ETsR, ETsU, and TC) was found to be significant with $F(3,1200) = 214.618$ ($p < 0.05$). Four methods of selection—enter, backward, forward and stepwise—were used to analyze multiple linear regressions. Results indicated that only two of the three individual predictors (ETsR and TC) were significant ($p < 0.05$), with a positive regression weight, indicating that BI increased as scores on ETsR and

TC increased. In addition, the positive regression weight for ETsU also indicated that higher scores on ETsU indicated higher scores on BI; however, this independent variable was not a significant predictor of BI. The MLR coefficients are shown in Table 2. The proportion of the variance in BI that was explained by emerging technologies reaction (ETsR), emerging technology understanding (ETsU) and technology competencies (TC) in combination was adjusted $R^2 = 0.348$, or 34.8%. The overall model summary is shown in Table 2.

Table 2: MLR Model Summary

Tutor				
Model[b]	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.605[a]	.366	.351	1.31521
Student				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.591[a]	.350	.348	1.24485

a. Predictors: (Constant), Competencies, Understanding, Reaction.
b. Dependent Variable: Intention.

Although in general students had a high perception of ETsU, this was not a useful predictor of technology acceptance. Indonesian students, who are from a collectivistic society, are dependent on their social group; their individual confidence level and their ETsU were not varied. Therefore, their ETsU did not influence BI. However, based on the interviews with students, the results indicated that students still used alternative ETs (e.g., Facebook, text messengers, Whatsapp) in order to keep up with the courses. Most of the students did not participate actively in online tutorials because of lack of tutor support; participation levels did not associate with ETsU. In addition, when taking online courses, students used search engines a lot in order to obtain more information. They also reported that the e-mails and discussion board in Facebook were very useful in terms of interacting with their peers.

The discovered value of adjusted R^2 of student data in this study indicated that the independent variables account for 35% of the accumulated variance. That is, aforementioned predictive constructs ETsR, ETsU, and TC have significant effects on dependent variable BI. In particular, as shown in table 1, weight-wise the impact of students' TC on dependent variable BI was greatest ($\beta = 0.357$, $p < .001$), followed by ETsR ($\beta = .242$, $p < .001$), ETsU ($\beta = 0.031$, $p > .01$).

Conclusion

Evidence from the MLR analysis demonstrated that technology competencies (TC) was the only significant predictor of behavior intentions (BI) among the three independent variables investigated for tutor data. For student data, emerging technologies (ETsR) and technology competencies (TC) were found to be significant predictors of BI.

This study contributes to the body of knowledge of emerging technologies acceptance in online tutorials by constructing a theoretical model introducing new constructs: emerging technologies reaction (ETsR), emerging technologies understanding (ETsU) and technology competencies (TC). The reason for introduction of different constructs in this theoretical model was the complexities of the organizational and social contexts within which instructors and students with varying individual characteristics make their decisions about using emerging technologies (ETs). Consequently, this study is expected to contribute in future research that will study acceptance of ETs.

There are two implications of this study for social change practice at the organizational level. First, the results provide key factors that affect instructors' and students' intentions to use ETs. They suggest that UT administrators should consider providing services for instructors and students who want to use ETs. Second, the findings will help the Department of Information and Technology at UT, especially learning management systems developers, to design and develop those systems that will be more likely accepted by instructors and students. Application of the concept of technology acceptance (TA) evaluation instruments should be a standard component of strategies prior to the introduction of new technologies to tutors and students.

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Appendix
Online Questionnaires

zoomerang

Technology Acceptance Questionnaires

Page 1—Question 1—Choice—One Answer (Bullets) [Mandatory]

Please identify the range in which your age appears

- ❍ 17–28 years
- ❍ 29–40 years
- ❍ 41–50 years
- ❍ 51–60 years
- ❍ More than 60 years

Page 1—Question 2—Choice—One Answer (Bullets) [Mandatory]

Gender

- ❍ Male
- ❍ Female

Page 1—Question 3—Choice—One Answer (Bullets) [Mandatory]

How many online tutorials are you participating in 2012.1?

- ❍ 1 online tutorial
- ❍ 2 online tutorials
- ❍ 3 online tutorials
- ❍ 4 online tutorials
- ❍ 5 online tutorials
- ❍ More than 5 online tutorials

Page 1—Question 4—Choice—One Answer (Bullets) [Mandatory]

How long have you been participating in online tutorial until semester 2012.1?

- ❍ Less than 1 year
- ❍ 1—<2 years
- ❍ 2—<3 years
- ❍ 3—<4 years
- ❍ 4—<5 years
- ❍ 5—6 years
- ❍ More than 6 years

Page 2—Question 5—Rating Scale—Matrix [Mandatory]

Using the scale provided, rate your CURRENT level of technology skills using each of the following emerging technologies (Note: N/A = not familiar with/do not use, 1=poor, 2=fair, 3=moderate, 4=intermediate and 5=advance)

Technology Skills	**N / A**	**1**	**2**	**3**	**4**	**5**
Send, receive, open, and read email						
Use advanced email features (e.g., attachments, folders, address books, distribution lists)						
Subscribe to and unsubscribe from a listserv (mailing list)						
Audio and videoconferencing (e.g., Skype, Windows Live, YM)						
Instant messaging (e.g., yahoo messenger, ICQ)						
Use a search tool to perform a keyword/subject search in an electronic database (e.g., CD-ROM, library catalog)						
Use advanced features to search for information (e.g., subject search, search strings with Boolean operators, combining searches)						
Use a search engine (e.g., Yahoo, Lycos, Google) to search for information on the web						
Use a web authoring tool (e.g., Wordpress) to create a blog						
Format a blog using tables, backgrounds, internal and external links.						
Use Wikipedia						
Create online pooling/survey						

Page 3—Question 6—Rating Scale—Matrix [Mandatory]

The questions below are based on emerging technologies that are available in online tutorial. These emerging technologies are communication, information retrieval and creation tools. Communication includes synchronous (audio and video conference, text messenger) and asynchronous (email, discussion board). Information retrieval consists of search engine that search for text, audio, picture, and video (Google Scholar, YouTube). Creation includes text, html (blog and Wikipedia), audio, video and image. Therefore, the emerging technologies (ETs) in this questionnaire refer to these three categories. According to Veletsianos (2010) ETs are: “Tools, concepts, innovations, and advancements that are utilized in diverse educational settings, to serve varied educational purposes, and that can be described as evolving or “coming into being.” (Note: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree).

Level of Learning	**1**	**2**	**3**	**4**	**5**
I felt comfortable using ETs for communication					
I felt comfortable using ETs for retrieving information					

Level of Learning	**1**	**2**	**3**	**4**	**5**
I felt comfortable using ETs for creating (text, html, audio, video, image)					
I would like use ETs for communication					
I would like use ETs for retrieving information					
I would like use ETs for creating (text, html, audio, video, image)					
ETs were relevant to my task for communication					
ETs were relevant to my task for retrieving information					
ETs were relevant to my task for creating (text, html, audio, video, image)					
It is easy to learn ETs, particularly for communication					
It is easy to learn ETs, particularly for retrieving information					
It is easy to learn ETs, particularly for creating (text, html, audio, video, image)					
I understand ETs and their application for communication					
I understand ETs and their application for retrieving information					
I understand ETs and their application for creating (text, html, audio, video, image)					
I can use the different tools of ETs for communication					
I can use the different tools of ETs for retrieving information					
I can use the different tools of ETs for creating (text, html, audio, video, image)					
I will improve my skills to learn ETs for communication					
I will improve my skills to learn ETs for retrieving information					
I will improve my skills to learn ETs for creating (text, html, audio, video, image)					
I will teach my colleagues how to use ETs for communication					
I will teach my colleagues how to use ETs for retrieving information					
I will teach my colleagues how to use ETs for creating (text, html, audio, video, image)					
I will always use ETs for completing my task mainly in communication area					
I will always use ETs for completing my task mainly in information retrieval					
I will always use ETs for completing my task mainly in creating something (text, html, audio, video, image)					

Page 4—Question 7—Rating Scale—Matrix [Mandatory]

Behaviorial Intentions to Use Emerging Technologies in Online Tutorials

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
I intend to use emerging technologies in online tutorials as soon as possible	m 1	m 2	m 3	m 4	m 5
I will use emerging technologies in online tutorials soon after it is available	m 1	m 2	m 3	m 4	m 5

Page 5—Question 8—Rating Scale—Matrix [Mandatory]

Perceived Technology Barriers

	Not a barrier	Minor barrier	Major barrier	N/A
Lack of or limited access to computers in UT	m 1	m 2	m 3	m 4
Not enough software available in UT	m 1	m 2	m 3	m 4
Lack of knowledge about technology	m 1	m 2	m 3	m 4
Lack of knowledge about ways to integrate technology into the curriculum	m 1	m 2	m 3	m 4
My assignments do not require technology use	m 1	m 2	m 3	m 4
Lack of technology accessibility in my classes	m 1	m 2	m 3	m 4
Too much learning materials to cover	m 1	m 2	m 3	m 4
Lack of mentoring or support to help me increase my technology skills	m 1	m 2	m 3	m 4
Emerging technologies-integrated curriculum projects require too much preparation time	m 1	m 2	m 3	m 4
There is not enough time in class to implement emerging technologies-based lessons	m 1	m 2	m 3	m 4

Page 6—Question 9—Open Ended—Comments Box [Mandatory]

Open ended question: “Based on your experiences, do you think online tutorials which have been running so far have met your expectations? Please explain it. What should be fixed if it has not met your expectations”?

Thank You Page

If you require further information regarding this survey, please contact me:

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