E-LEARNING ACCEPTANCE
BY UNIVERSITY STUDENTS IN INDONESIA
USING UNIFIED THEORY OF ACCEPTANCE AND
USE OF TECHNOLOGY

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ABSTRACT

Indonesian goverment regulation of the utilization of e-learning has encouraged the development and implementation of national education information system based on ICT at various levels of education, including higher education in Indonesia. Various effects will influence the perception of students and teachers to use ICT. The purpose of this study is to analyze the behavior and adoption of ICT in particular e-learning to university students in Indonesia.

This study was conducted at a private university in Indonesia and used qualitative primary data survey. The respondents are 180 students. 5 Scale Likert of Summated Rating (LSR) was used to measure the perception variables. The research instrument use Unified Theory of Acceptance and Use of Technology (UTAUT) with 6 variables. This variables are Performance Expectancy, Effort Expectancy, Internet Self Efficacy, High Anxiety, Social Influence and Facilitating Conditions.

The data were processed using independent sample t test to determine differences in the value of the UTAUT variables based on gender and departement. The students assess that effort expectancy is higher than the performance expectancy, Internet anxiety, and social influence. Some of UTAUT variables show the differences based on gender and departement.

Keyword: e-learning, UTAUT, user acceptance

1. INTRODUCTION

The successful of ICT implementation begins diffusion process that is an initial step of the use ICT. ICT is seen as a new innovation that has to go through several steps before the technology is used and provide benefits to users. All sections of society are changed by the evolution of ICT. These changes encourage the impact of higher education institutions can not be changed, which are expected to adopt innovative

technologies in their teaching practices, Gonçalves and Pedro [9]. One of ICT type is growing rapidly and intensively applied in higher education is internet.

The major driver of ICT in education is internet however the bandwidth is a major issue in the deployment of e-learning, Oye et all [20]. The konventional methodology and architecture of education system around the world are changed by internet. The changes are the method of teaching and student interaction in with subject   materials and all related relevant information, Khan and Badii [16].

As a tool, the use of ICT is determined by smooth process of adoption by users, including the use of ICT in higher education. ICT implementation failure can be caused by the acquisition or internalization of ICT in higher education. Thus, the process of ICT diffusion become interesting study because as a tool, ICT should be received by the user, especially the students. This research focuses on the adoption of ICT in the higher education in Indonesia, specially e-Learning based on the perception of the students by using UTAUT model of Venkantes et al. Information and communication technologies (ICT) that use by the student is called e-learning, Laurillard [7]. The adoption of technologies will be success in classrooms if it depends on the pedagogical models of content to enhance the technology design of learning Chang et al [5].

The purpose of this research is to analyze the adoption of e-learning that has been implemented at a private university in Indonesia. The acceptance of e-learnng process by the students associated with the profile and behavior of the students in the using ICT.

2. THEORETICAL BACKGROUND
2.1 Function and Element of E-learning
According to Artino [1], the latest developments in the world of higher education indicate that online learning will continue to be an important part of life long learning in the modern era. The diversity in education and teaching methodology is influenced by the improvement of science and technology, Khan and Jumani [17].

The types of Information and Communication Technology (ICT) in higher education including e-learning, mobile learning, and the learning processes and academic information access electronic or internet based. ICT use needs to be evaluated, including through the measurement of perception or perspective of the users of ICT, especially the faculty and students. The success of ICT integration in higher education depends on several aspects, Gonçalves and Pedro [9].

The knowledge and performance are improved by using internet technologies in E-learning, Ruiz et all [15]. The use of any of the new technologies or applications in the service of learning or learner support is called E-learning, Laurillard [7]. All of learning and teaching processes supported by electronic are called e-learning, Jethro et all [14]. ICT become important in E-learning to provide teaching and learning in delivery of the higher education, Penny [23].

Badrul H. Khan and Vinod Joshi [2] explain the element of e-learning in detail, namely (1) *Institutional* is "The institutional dimension is concerned with issues of administrative affairs, academic affairs and student services related to e-learning"; (2) *Management* is "The management of e-learning refers to the maintenance of learning environment and distribution of information"; (3) *Technological* is "The technological

dimension of e-learning examines issues of technology infrastructure in e-learning environments"; (4) *Pedagogical* is "The pedagogical dimension of e-learning refers to teaching and learning"; (5) *Ethical* is "The ethical considerations of e-learning relate to social and political influence, cultural diversity, bias, geographical diversity, learner diversity,digital divide, etiquette, and the legal issues"; (6) *Interface design* is "the overall look and feel of e-learning programs"; (7) *Resource support* is "The resource support dimension of the e-learning examines the online support and resources required to foster meaningful learning"; dan *Evaluation* is "The evaluation for e-learning includes both assessment of learners and evaluation of the instruction and learning environment."

Vassiliadis et al [28] describes the simple framework for e-learning has three core components, namely technological, economic, and pedagogic. At the next layer, the aspect that considered is the cost effectiveness, quality, strategy, and models of e-learning. The frame work can be seen in the figure 1 below.
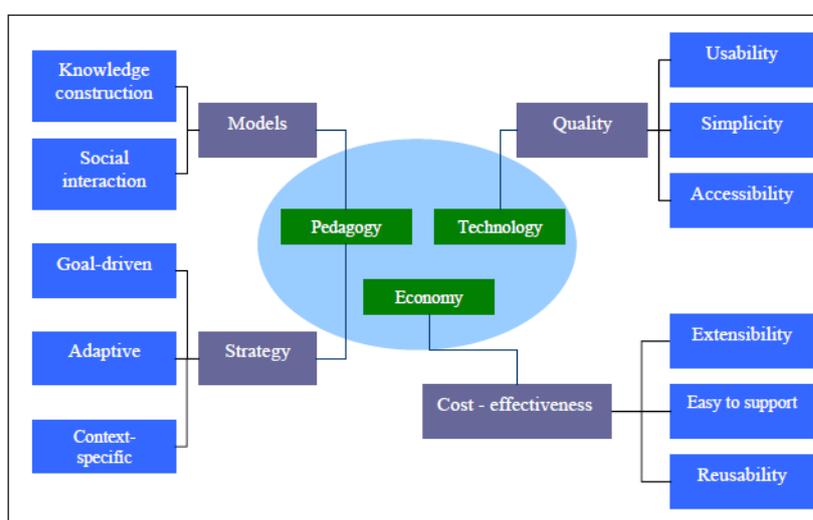

Figure 1. The frame work of e-learning, Vassiliadis et all [28]

2.2 Unified Theory of Acceptance and Use Technology

The existence of the new technologies begins from awareness and curiosity about it. Therefore the use of ICT in the context of the innovation theory diffusion begins from awareness, furthermore it become interest or curiosity about the technology. If the curiosity lead to action or decision, then the next technology is acquired or used by individual or company. The step are called as the innovation-diffusion process that was introduced by Rogers (2003) at the first time and it was cited by Sahin [25]. Innovation diffusion process has four key elements, namely innovation, communication channels, time, and social system.

According to Roger (2003) the process of innovation diffusion as quoted by Sahin [25] is an information-seeking and information-processing activity, where an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation. The process consists of five step, namely knowledge, persuasion, decision, implementation, and conformation. The model of the innovation diffusion process can be seen in the figure 2 below.
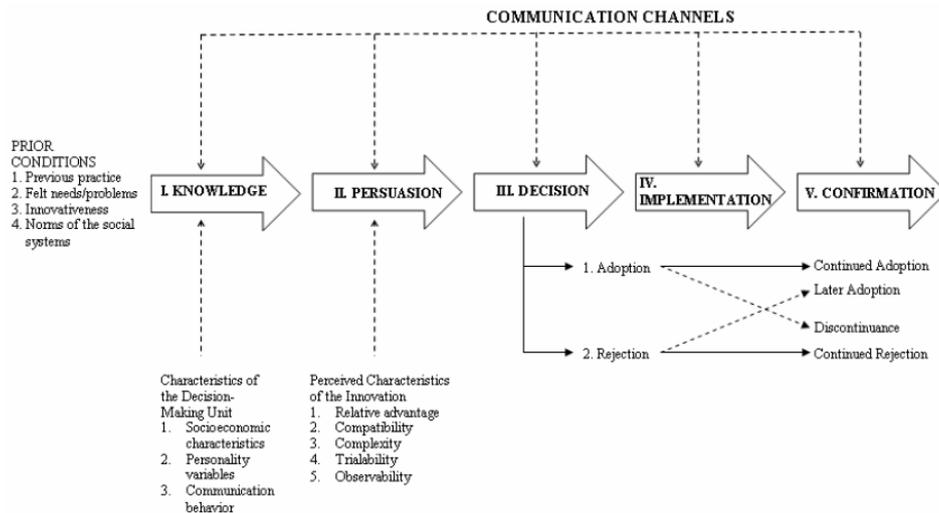
Figure 2. The model of diffusion innovation proposed by Rogers, Sahin [25]

The theories related to individual factors in the use of information technology include Theory of Planned Behavior (TPB), Theory of Reason Action (TRA), Social Cognitive Theory (SCT), and Technology Acceptance Model (TAM), and the last model is Unified Theory of Acceptance and Use of Technology (UTAUT). The model of this research is UTAUT.

The UTAUT model that proposed by Venkatesh et al. [29] is a model based on the basic theories of user behavior and acceptance model, such asTRA, TAM, TPB, Motivational Model, Personal Computer Utilization Model, and also the innovation diffusion theory of Rogers. UTAUT model consists of four variables that determine the goal and the use of information technology, namely (1) performance expectations, (2) effort expectancy, (3) social influence, and (4) facilitating conditions. The variables are also as moderating variables between determinant with the purpose and use of information technology, namely (1) gender, (2) age, (3) experience, and (4) voluntariness (mandatory or not the use of information systems in the work). UTAUT model can be seen in the figure 3 below.
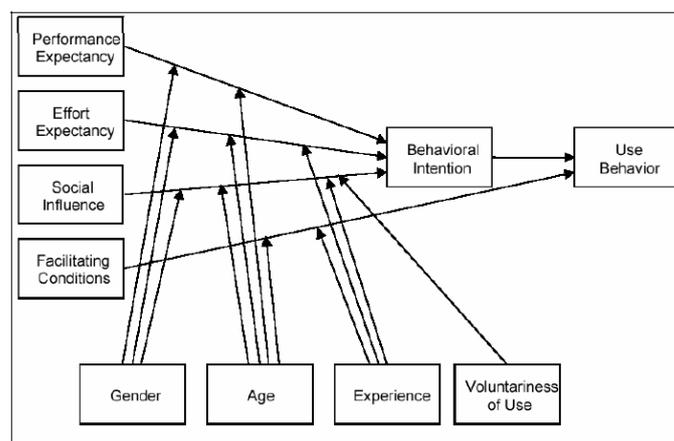

Figure 3. Unified Theory of Acceptance and Use of Technology, Marchewka and Liu [18]

Farida and Hermana [8] conducted a meta-analysis of the 23 scientific articles about the use of TAM and UTAUT to model the acceptance of ICT in higher education. The

researches use UTAUT models more than the TAM with ratio 14 : 9. The type of ICT is most widely studied is E-learning/VLE, including mobile learning, followed by the adoption of ICT or education technology. Some of the results of previous research on the adoption of e-learning by using the UTAUT model, namely (1) Performance Expectancy and Effort Expectancy variable showed a high perception of the use of mobile learning, Jairak et al [11]; (2) facilitating condition and diversity of the individual perception UTAUT as a major factor in the use of web-based Learning Management System, Park and Lee [22]; (3) Self-efficacy variables, structural factors, and benefits related to each other in the use of virtual learning , Buchanan et al, [4]; and (4) Effort Expectancy and Facilitating Conditon variable showed perception level relative high on the use of mobile learning, Nassuora [19]. Some of the analysis result about the adoption of e-learning showed that the UTAUT and TAM models can predict the behavior of the use of e-learning by the lecturer and the students at the university.

3. METHODOLOGY

This research involves 180 respondents who are registered as students of the user virtual class that is managed by a university in Indonesia. The measurement of student perceptions conducted in the same week in February 2014. The facility of virtual-class does not stand alone but it is supplement of conventional teaching and learning process. The features of virtual class includes instructional materials in various formats, electronic discussion forums, and online assignment. The use of discussion forum according to the statement of Johnston, Killion, and Oomen [12] that the forums allow students to interact to each other so that it can be reduced feelings of isolation. According to Shana [26], the discussion forums have an impact on the behavior and success of students on the distance learning or implementation of educational technology.

The instrument of research refers to UTAUT model with four variables, Venkatesh et all, [29]. The variables are performance expectancy, effort expectancy, social influences and facilitating conditions. The definition of performance expectancy is the degree to the which an individual believes that using the system will help him or her to attain gains in performance; effort expectancy is the degree of ease associated with the use of the system; social influences is the degree to the which an individual perceived that important others believe he or she should use the new system; and facilitating conditions is the degree to the which an individual believes that an organizational and technical infrastructure exists to support use of the system.

The scale of measurement for the variable is 5-Likert Summated Rating scale: strongly disagree, disagree, neutral, agree, and strongly agree. The realibility of instrument is measured by Cronbach alpha while its validity is tested by Kaiser-Meyer-Olkin (KMO) and Bartlett test. The differences of predictor variables in the model UTAUT can be seen from the demographic of students profile which is tested by independent sample t test / ANOVA.

4. RESULT AND DISCUSSION

The measurement of instrument indicates that five variables have high reliability and validity, namely performance expectancy, effort expectancy, social influence, internet self-efficacy, and internet anxiety but facilitating condition is not valid and reliable. The result of test can be seen in the table 1 below.

Table 1. Reliability and validity of research instrument

No.	Variables	If Items deleted	Cronbach α	Loading Factor	KMO	Bartlett Test X	Sign.	Details
1.	Performance Expectancy	0.738	0.761	0.706	0.746	170.794	0.00	All items are valid and reliable
		0.707		0.760				
		0.662		0.816				
		0.702		0.768				
2.	Effort Expectancy	0.769	0.769	0.682	0.724	206.203	0.00	All items are valid and reliable
		0.686		0.800				
		0.671		0.842				
		0.728		0.764				
3.	Facilitating Condition	0.469	0.451	Split into 2 factors	0.538	78.072	0.00	All Item is not valid and reliable
		0.370						
		0.301						
		0.419						
		0.421						
4.	Social Influence	0.711	0.710	0.627	0.653	153.697	0.00	All items are valid and reliable
		0.676		0.683				
		0.590		0.821				
		0.604		0.795				
5.	Internet Self Efficacy	0.411	0.506	0.815	0.724	229.119	0.00	Item 4deleted and α increase0.765
		0.408		0.840				
		0.430		0.722				
		0.765		0.338				
		0.395		0.679				
6.	Anxiety	0.882	0.911	0.893	0.848	480.987	0.00	All items are valid and reliable

Furthermore facilitating and one item of the internet self-efficacy is not used in the analysis data.

Profile of respondents are majority male, come from computer science departement, have 75-100% presence rate in class and 2.50-2.99 student achievement index. The profile of respondents can be seen in table 2 below.

Table 2. Profile of respondents

Demography	Total	Percent
Gender		
- Female	77	42.8 %
- Male	103	57.2 %
Departement		
- Computer science	103	57.2 %
- Economic	77	42.8 %
Presence		
- 50 – 74 %	18	10 %
- 75 – 100 %	147	81.7%
- No answer	15	8.3 %
Student Achievement Index		
- 2.00 – 2.49	23	12.8 %
- 2.50 – 2.99	94	52.2 %
- 3.00 – 3.49	50	27.8 %
- 3.50 – 4.00	5	2.8 %
- No answer	8	4.4 %

Generally, respondents have relatively high expectations on performance and effort required to use a virtual class. It is showed by all items have value more higher than 3.5. The students ability of using internet is high that high impact on social influence

in the virtual class. Students who are not include internet users have anxiety of the internet negative impact. The overview of each research variables can be seen in the figure 4 below.
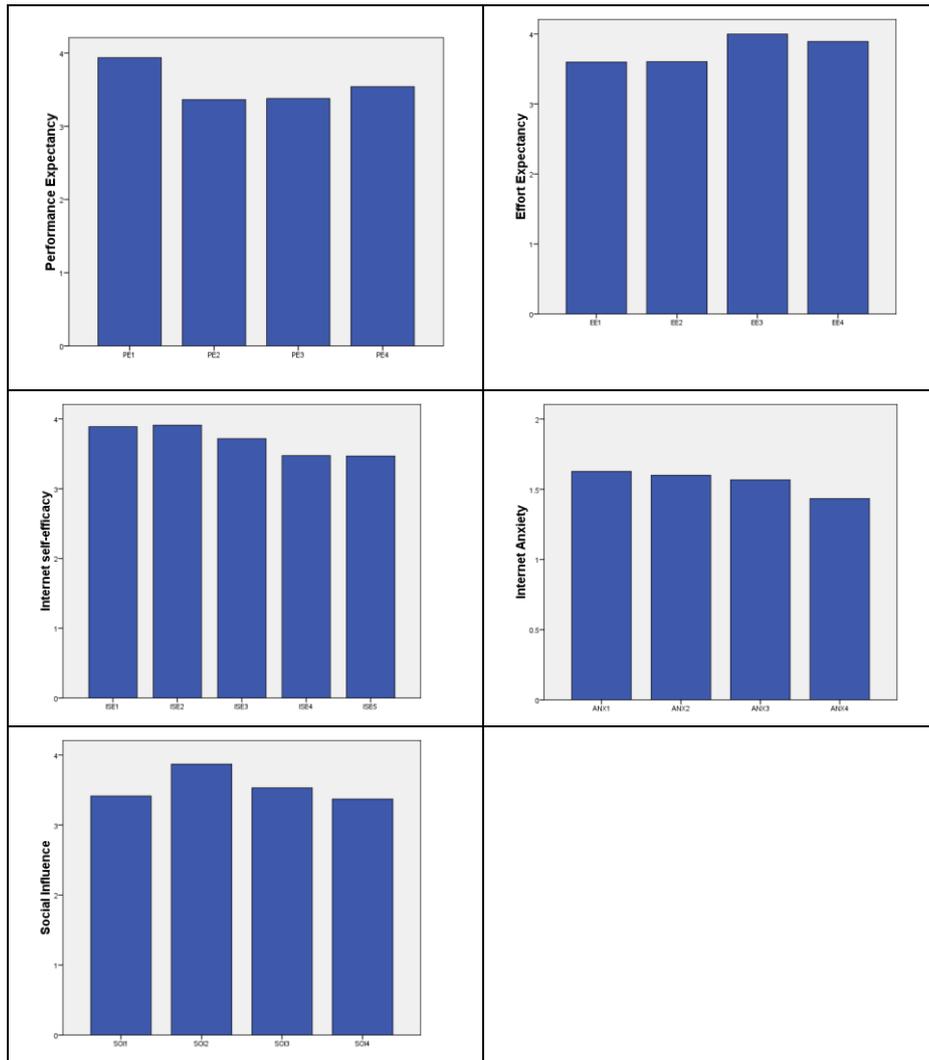

Figure 4. Overview of research variable

The students of economics department in general have relatively high performance expectancy compare to the students of computer science departement, but they have tendency to be more concerned in using the internet. It means the students of economic departement   has more benefits using virtual class, although they are more difficult using virtual class as seen in the value of effort expectancy is lower than the student of computer science departement. The students of economics departement are also more dominant in Social influence. It is seen that using virtual class is encouraged by friends, professors, or others who close relationship with the student of economics departement. The difference between the students of economics   and computer science department based on gender can be seen in the figure 5 below.
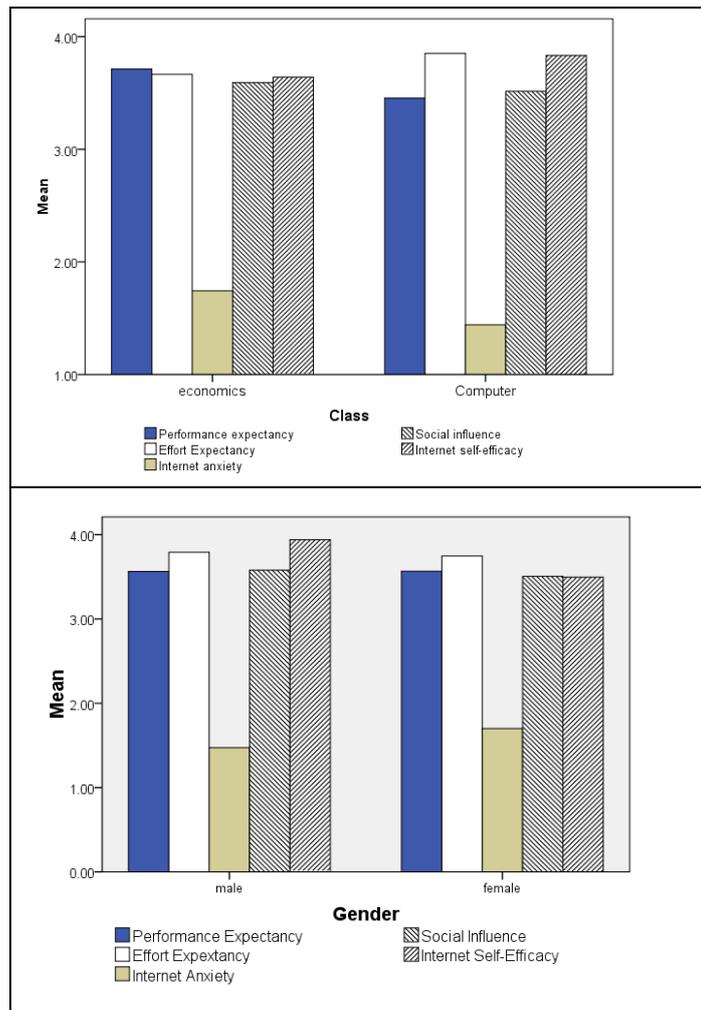
Figure 5. The comparation of variablebased on gender and departement

The students of computer science departement clearly have knowledge and experience better than students of economics departement. It is consistent with the statement of Bonillo [3] that the student experience in technology related to the area of expertise, in addition also influenced by gender and departement. The difference of perception in the development of e-learning is also stated by Tutunea, Rus, and Toader [27] that mentions the different perceptions of the students, the lecturer in university.

The female students have tendency concerned and confidence using internet lower than male, even though the other variables are relative the same. The results of independent sample t test showed significant differences for four variables: performance expectancy, effort expectancy, internet anxiety and internet self-efficacy, whereas social influence is no significant. The results of test can be seen in the tables 3 below.

Table3. The comparation of test result based on departement

		Levene's Test		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.	95% Confidence Interval of the Diff.	
									Lower	Upper
PE	Equal variances assumed	6.051	.015	3.077	177	.002	.27231	.08849	.09768	.44694
	Equal variances not assumed			3.194	176.976	.002	.27231	.08526	.10406	.44057
EE	Equal variances assumed	1.849	.176	-2.217	178	.028	-.19699	.08884	-.37230	-.02168
	Equal variances not assumed			-2.185	152.634	.030	-.19699	.09014	-.37508	-.01890
ANX	Equal variances assumed	2.802	.096	3.286	178	.001	.30567	.09302	.12211	.48922
	Equal variances not assumed			3.180	140.339	.002	.30567	.09613	.11562	.49572
SOI	Equal variances assumed	.535	.465	.858	178	.392	.07392	.08610	-.09600	.24383
	Equal variances not assumed			.873	172.801	.384	.07392	.08462	-.09311	.24095
ISE	Equal variances assumed	.487	.486	-2.597	179	.010	-.21557	.08301	-.37937	-.05177
	Equal variances not assumed			-2.559	154.388	.011	-.21557	.08424	-.38198	-.04915

Table4. The comparation of test result based on gender

		Levene's Test		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.	95% Confidence Interval of the Diff.	
									Lower	Upper
PE	Equal variances assumed	.636	.426	-.238	177	.812	-.02161	.09081	-.20083	.15760

		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
	Equal variances not assumed			-.243	173.668	.808	-.02161	.08900	-.19727	.15404
EE	Equal variances assumed	.045	.833	.671	178	.503	.06035	.08994	-.11714	.23784
	Equal variances not assumed			.670	161.273	.504	.06035	.09002	-.11741	.23811
ANX	Equal variances assumed	.079	.779	-2.459	178	.015	-.23165	.09421	-.41757	-.04574
	Equal variances not assumed			-2.501	170.662	.013	-.23165	.09262	-.41448	-.04883
SOI	Equal variances assumed	3.715	.056	.855	178	.394	.07360	.08611	-.09632	.24352
	Equal variances not assumed			.886	177.740	.377	.07360	.08305	-.09028	.23749
ISE	Equal variances assumed	.355	.552	5.932	179	.000	.45854	.07730	.30601	.61108
	Equal variances not assumed			6.007	170.804	.000	.45854	.07633	.30787	.60921

The results of independent t test based on gender shows that only internet anxiety and internet self-efficacy variable have significant difference. The female students have more anxiety and does not have sufficient ability using internet than male. These results are consistent with research Yukselturk and Bulut [30] that there was no significant difference regarding the motivational confidence related to gender issues, as well as the research of Hu et al [10] that male students tend to have the perception of internet self-efficacy, experience, and information overload. The problem of concern and confidence using internet requires a different treatment as raised by Yukselturk and Bulut [30].

5. CONCLUSION

According to the students assessment, the virtual-class application is easy to use and usefull to achive the success of the teaching and learning process. The perception is also supported by the anxiety level of using internet is relative low but the confidence of the students ability using computer is relative high. Nevertheless based on department, the students of economics departement have   concerns and technical ability lower than the students of computer science department. They also need help from the others and require more higher effort using the virtual class application. This condition is caused by background and different experiences using internet, includes the capabilities of supporting technologies such as computer hardware, network infrastructure and internet connection.

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