The Role of E-Learning in Learning

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Abstract. This study aims to examine research instruments regarding the role of e-Learing in Universities located in Indonesia. Data obtained from the questionnaire field are distributed online and have been filled by as many as 100 respondents with a population of e-learning users from various professional backgrounds. The questionnaire was filled by 100 respondents with different professional backgrounds, namely students, lecturers, teachers, employees, entrepreneurs, civil servants, and then collected and processed data by testing using inductive or inferential statistics. The method used is a qualitative method, while testing includes validity and reliability, chi square test, t test, f test and classic assumption test in multiple linear regression by processing data using SPSS version 24, by testing the validity and reliability based on data that has been tested from Y to X8 the value of Cronbach's Alphanya 0.984> 0.1654 means that the data is tested for reliability.

Keywords: e-Learning, Effective, Efficient, Validity, Reliability

1 Introduction

Presenting and creating a high quality education and making fundamental changes to make the Unitary State of the Republic of Indonesia from a developing country as a developed, prosperous, just and prosperous country as aspired to the nation's founders and all the people of Indonesia also set out in the Opening of the Constitution of the Republic of Indonesia In 1945 that to form an Indonesian Government that protects all Indonesian people and all Indonesian blood and to promote public welfare, educate the nation's life, and participate in carrying out world order based on independence, lasting peace and social justice[1].

To produce superior and high quality education it has been realized by the leaders of the Indonesian movement and is the ideals of all the people of Indonesia, starting in 1908 the National awakening, set out in Article 31 of the 1945 Constitution of the Republic of Indonesia that every citizen has the right to education[1].

As part of the national education system, higher education has a strategic role in educating the nation's life and advancing science and technology as well as to enhance the nation's competitiveness in the face of globalization in all fields, so the government is required to produce educational policies.

The Government has established policies in the administration of national education, contained in Law of the Republic of Indonesia Number 12 of 2012 concerning Higher Education, Law of the Republic of Indonesia Number 20 of 2003 concerning the National

ICONISTECH 2019, July 11-12, Bandung, Indonesia

DOI 10.4108/eai.11-7-2019.2298033

Education System replaces Law of the Republic of Indonesia Number 2 of 1989 Concerning National Education System. Besides stipulated in the law, there are also other policies contained in Government Regulation of the Republic of Indonesia Number 4 of 2014 concerning the Implementation of Higher Education and Management of Higher Education, Government Regulation of the Republic of Indonesia Number 13 of 2015 concerning Second Amendment to Government Regulation Number 19 of 2005 concerning National Education Standards, Government Regulation of the Republic of Indonesia Number 19 of 2005 concerning National Education Standards, Government Regulation of the Republic of Indonesia Number 32 of 2013 concerning Amendment to Government Regulation Number 19 of 2005 concerning National Education Standards, Government Regulation of the Republic of Indonesia Number 66 Year 2010 concerning Amendments to Government Regulation Number 17 of 2010 concerning Management and Implementation of Education, Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 49 of 2014 concerning National Standards of Higher Education.

The rapid development of technology makes the education system in Indonesia continue to experience better development and more advanced to follow other countries. The education system in Indonesia, which is still using conventional systems, is now beginning to switch to digital systems, the learning process that only occurs in classrooms and learning schedules, now the learning process is not bound by space and time, it can be done anytime and anywhere using the internet.

With the introduction of the internet world, especially e-learning learning, that is by using Internet technology that can improve learning knowledge and performance and have advantages that students can choose (place and time of learning), compared to conventional learning conducted in the classroom.

E-learning is a learning system based on formal teaching but with the help of electronic resources[2]. e-Learning is learning to use electronic technology to access educational curricula outside traditional classrooms. In most cases, this refers to the program, program or degree that is delivered online. The learning process can be done inside or outside the classroom, computers and the internet is a form of major components of the application of e-learning[3]. Learning E-learning uses electronic technology to access educational curricula outside traditional classrooms[4].

With the application of e-learning, of course Universities that have carried out the process of higher education learning want to know the extent of the results rather than the application of e-learning that has been implemented in tertiary institutions.

Reading is one of the important phases in the learning process, Learning efficiently depends on the presentation of information that can be requested and accessed through the internet in the e-learning system. whereas effective learning is related to influence by recognizing and understanding human emotions.

From this background, this study discusses the effectiveness and efficiency of the role of e-learning within the university. Some research related to the e-Learning in learning environment is available and can be found in world databases such as Scopus, Springer or ScienceDirect. The research includes : which shows the creation of expert e-learning system content based on tree data structures using artificial intelligence[5], to explore the concepts of cloud computing and e-learning and their benefits if these two technologies are combined with the intended use by higher education institutions[6], to clarify the basic concepts and advantages of E-Learning and find a vision of using information and communication technology for the electronic learning process in facing the challenges of this century and future problems[7], a new technique for face recognition, this technique has a large

application level including identification, authentication, psychology, e-learning, security, marketing and human interaction and computer[8], the main role of the Web Socket protocol in an E-learning system can transfer a number of data without the overhead associated with traditional HTTP[9], e-Learning Model for Equivalency Education Program in Indonesia, proposes an E-Learning model to support non-formal education in Indonesia. This model is referred to as E-learning for the Equality Education Program Model (E-LEEP) consisting of three components: Users, Education Programs, and Monitoring[10], the influence of motivation in the context of the use of e-learning to facilitate the learning process, improve student performance, and to observe the literature in the use of e-learning. to ensure that e-learning is part of a blended learning system that can optimize student learning experiences[11], involving students in e-learning learning for a longer duration of time, in a learning atmosphere and adaptive learning content to express students' emotional behavior[12], the involvement of the use of ICT to teach and deliver learning material, the readiness of students to use the University e-Learning system to improve learning efficiency and opportunities and the results show, the most important factors are confident e-learning and e-learning training not e-learning readiness[13]. Factors influencing learning outcomes related to e-learning and blended learning include the presence of educators in online settings, interactions between students, teachers and the contents of the material / content, connections designed between online and offline activities related to related practices[14].

The world of education is growing very rapidly followed by the trend of teaching that uses e-learning as a teaching and learning activity by utilizing ICTs as one of the roles of mobile phones to implement teaching and learning activities. Mobile phones are not only used for communication, texting and other activities, the latest mobile phones provide a simple and easy way to develop teaching and learning activities, therefore, on this occasion we will examine the effective and efficient e-Learning learning media at universities located in Indonesia. Building user attitudes towards computers and Internet technology can be divided into three main measures : measurement of affective, cognitive, and behavioral. Affective measurement such as pleasure perception, cognitive measurement such as perceptions of self-efficacy and perceived usefulness have a positive effect on behavioral measurement such as behavioral intention to use e-learning as a teaching or learning tool[15].

In addition to growing with the internet, computers, instant messaging, video games and cell phones, the "millennial" generation as it is known, has very different views on access to information than their parents and grandparents (Prensky, 2001). To design an effective e-learning environment, Liaw (2004) suggests three considerations : student characteristics, teaching structure, and interaction. In developing e-learning, it is necessary to understand the targeted population. First, learner characteristics, such as attitudes, motivations, beliefs, and beliefs need to be identified (Passerini & Granger, 2000). Basically, e-learning signifies an independent learning environment. In other words, users have more opportunities to learn independently in an e-learning environment. As for the structure of teaching, multimedia instruction allows students to develop complex cognitive skills, such as understanding important elements of conceptual complexity, the ability to use concepts obtained for reasoning and inference, and the competence to apply conceptual knowledge to new situations with flexibility (Spiro, Feltovich, Jacobson, & Coulson, 1995). Finally, the e-learning environment offers group interaction, such as students to students, or students to instructors.

Group interaction is a type of cooperative learning that helps students make progress through their zones of proximal development with the activities in which they are involved (Vygotsky, 1978). When students increase their interaction with instructors and students, they in turn increase their opportunities to build their own knowledge because a lot of unavoidable learning occurs in social contexts, and the process involves constructing mutual understanding (Bruner, 1971). So, based on fundamental e-learning criteria, these are three considerations in designing an e-learning environment: independent learning, a multimedia environment, and teacher-assisted learning. Previous research (Triandis, 1971) suggested that attitudes consist of components of affective, cognitive, and behavioral. Affective components are emotions or feelings that include statements of likes or dislikes for certain objects. The cognitive component refers to a statement of belief. And the component of behavior is what individuals actually do or want to do[16].

This study investigates the effectiveness of using e-learning in teaching in tertiary institutions. In institutions of higher education, the issue of utilizing modern information and communication technologies for teaching and learning is very important. This study reviews literature and gives a scholarly background to the study by reviewing some contributions made by various researchers and institutions on the concept of e-learning, particularly its usage in teaching and learning in higher educational institutions. It unveils some views that people and institutions have shared globally on the adoption and integration of e-learning technologies in education through surveys and other observations. It looks at the meaning or definitions of e-learning as given by different researchers and the role that e-learning plays in higher educational institutions in relation to teaching and learning processes, and the advantages and disadvantages of its adoption and implemention. E-learning involves the use of digital tools for teaching and learning. It makes use of technological tools to enable learners study anytime and anywhere. It involves the training, delivery of knowledge and motivates students to interact with each other, as well as exchange and respect different point of views. It eases communication and improves the relationships that sustain learning. Despite some challenges discussed, the literature has sought to explain the role of elearning in particular and how eLearning has made a strong impact in teaching and learning. Its adoption in some institutions has increased faculty and learner's access to information and has provided a rich environment for collaboration among students which have improved academic standards. The overall literature which explains the advantages and disadvantages of elearning suggests the need for its implementation in higher education for faculty, administrators and students to enjoy the full benefits that come with its adoption and implementation[3]. In the formulation of this problem, how to measure the effective and efficient e-Learning in one of the universities located in Indonesia. In the research objectives: first, examine the level of the relationship between the independent variable and the dependent variable. Second, examine the relationship between variables, so that the results can be known effective and efficient learning by e-Learning.

2 Research Methodology

Data for this study were collected using a questionnaire distributed via online. The questionnaire includes : (1) The role of e-Learning (2) Demographics of questionnaire fillers. The details of each questionnaire, First : Fields related to the role of e-Learning in learning, respondents answered statements from 81 items that included discussion of e-Learning, System Performance, System Security, E-Readiness, Behavior, Management, Effectiveness, Efficiency, Organizing Institution.

The statements use a scale of measurement using a Likert scale starting with a value or number that is 4 value “Strongly Agree”, 3 value “Agree”, 2 value “Disagree” and 1 value “Disagree”. After processing the data it results that there is an effective and efficient connection between users and e-Learning learning (results show on tables 1). Second : Fields relating to the respondent's demographics include name, institution, address, application used, gender, age, education, occupation. Research of methodology by using qualitative approach.

3 Results and Discussion

3.1 The results

The result obtained based on the questionnaire that has been processed using SPSS version 24, regarding the relationship between independent and dependent variables concerning e-learning variables with variables (System Performance, System Security, e-Readiness, Behavior, Management, effective, efficient and Organizing Institution) the results of this test indicate a relationship.

Table 1. Univariat Demographics

No	Variable		e-Learning			Result
			Active	Unactive	Total	
1	Gender	1. Male	75	4	79	There is not relationship
		2. Female	19	2	21	
		Total	94	6	100	
2	Age	1. 18-25	74	4	78	There is relationship
		2. 26-35	8	1	9	
		3. 36-45	2	2	4	
		4. 46-55	3	1	4	
		5. >55	4	1	5	
		Total	91	9	100	
3	Address	1. Outside Institution	24	2	26	There is not relationship
		2. Inside Institution	71	3	74	
		Total	95	5	100	
4	Education	1. Student & College Students	35	1	36	There is not relationship
		2. Diploma	2	1	3	
		3. S1	43	2	45	
		4. >S2	15	1	16	

No		Variable		e-Learning Active	e-Learning Unactive	Total	Result
			Total	95	5	100	
5	Job	1. College Student		70	5	75	
		2. Employee		5	3	5	
		3. Civil servants		2	0	2	There is
		4. Lectures/Teachers		12	2	14	relationship
		5. Other		1	0	2	
			Total	90	10	100	

In table 1 shown the relationship of variables to demographics with e-learning that have a relationship or there is a relationship that occurs at age and occupation while those with no relationship occur in gender, address and education. e-Learning is active on demographics has an overall impact (93%), includes gender (94%), age (91%), address (95%), education (95%) and job (90%). e-Learning is active based on gender (47%), includes male (75%), and female (19%). e-Learning that is active based on the overall age (20%), 18-25 years (81%), 26-35 years (9%), 36-45 years (2%), 46-55 years (3%) and > 55 years (4%). e-Learning is active based on overall address (48%), includes inside institution (24%), and outside institution (71%). e-Learning that is active based on education (24%), includes Students & Collage Students (37%), Diploma (1%), S1 (45%), and S2 (26%). e-Learning is active based on the overall jobs (18%), includes Students (78%), Employees (6%), civil servants (2%), lecturers / teachers (13%) and others (1%). e-Learning is active on Demographics based on gender is male, age is 18-25 years, address is outside institution, education is S1 and job is student.

Table 2. Relations between Variables

No	Variable			e-Learning Active	e-Learning Unactive	Total	Result
1	System Performance	1. Performance		96	1	97	There is relationship
		2. Unperformance		2	1	3	
			Total	98	2	100	
2	System Security	1. Secure		96	0	96	There is relationship
		2. Unsecure		3	1	4	
			Total	99	1	100	
3	e-Readiness	1. e-Readiness		94	0	94	There is relationship
		2. Un e-Readiness		5	1	6	
			Total	99	1	100	
4	Behavior	1. Honest		15	2	17	
		2. Not Honest		0	1	1	
		1. Trust		21	2	23	
		2. Not Trust		0	1	1	There is relationship
		1. Messanger		21	4	25	
		2. Unmessanger		0	2	2	
		1. Intelligent		22	7	29	
		2. Not Intelligent		0	2	2	
			Total	79	21	100	
5	Management	1. Management		95	1	96	There is relationship
		2. Not Management		3	1	4	
			Total	98	2	100	
6	Efective	1. Efective		80	2	82	There is

No		Variable	e-Learning Active	e-Learning Unactive	Total	Result
		2. Not Efective	3	15	18	relationship
		Total	83	17	100	
7	Eficiency	1. Eficiency	97	1	98	There is relationship
		2. Not Eficiency	1	1	2	
		Total	98	2	100	
8	Organizing Institution	1. Organizing Institution	96	1	97	There is relationship
		2. Not Organizing Institution	1	2	3	
		Total	97	3	100	

In table 2 shown the relationship between variables with e-learning all shows a relationship with these variables including system performance, system security, e-readiness, behavior, management, effective, efficient and organizing institutional.

Active e-Learning has an overall impact (92%), detail on system performance (96%), system security (96%), e-Readiness (94%), behavior (79%), management (95%), effective (80%), efficient (97%) and institutions (96%). e-Learning is active on system performance (50%), includes performance (98%) and unperformance (2%).

E-Learning is active based on overall system security (50%), includes (96%), unsecure (3%). E-Learning is active based on overall e-readiness (50%), includes e-readiness (94%) and not e-readiness (6%). E-Learning is active based on behavior (79%), includes honesty (60%), trust (84%), messanger (84%) and intelligence (84%). e-Learning is active based on overall management (50%), include management (97%), unmanagement (3%). e-Learning is active based on overall effective (50%), include effective (94%) and in-effective (6%). e-Learning is active based on overall Efficiency (50%), includes efficiency (94%), in-efficient (6%). e-Learning is active based on the Institution (50%), include institutions (94%) and not institutions (6%). The relationship between variables with e-learning all shows a relationship with these variables including system performance, system security, readiness, behavior, management, effective, efficient and institution. e-Learning is the relationship between variables with e-learning has a dominant impact based on : system performance that is performing (existing), System security which is safe, e-Readiness namely e-readiness, Behavior that is smart, Management namely management, Effective, namely effective, efficient, that is efficient, Institution, namely the condition of the Organizing institution.

3.2 Discussion

In this discussion about the testing carried out based on questionnaire data that has been filled and processed.

- **Test Reliability and Validity**

In table 3 and table 4 explain the results of reliability and valid testing of processed data using SPSS version 24 (Statistical Package for the Social Sciences).

Table 3. Reliability Statistic

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,984	,985	81

In table 3 shows based on testing data from variable Y to X85, the value of Cronbach's Alpha 0.984> 0.1654 means that the data tested is reliability.

Table 4. Item-Total Statistic

Item-Total Statistics					
Responden	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Remark	Cronbach's Alpha if Item Deleted
Y1	257,8900	1025,493	0,615	Valid	0,984
Y2	258,0300	1021,221	0,666	Valid	0,984
Y3	258,0800	1021,872	0,689	Valid	0,984
Y4	258,0700	1026,490	0,514	Valid	0,984
Y5	258,5100	1020,757	0,582	Valid	0,984
X11	258,0300	1028,494	0,508	Valid	0,984
X12	258,0200	1024,686	0,627	Valid	0,984
X13	258,0600	1023,754	0,629	Valid	0,984
X14	258,2800	1018,264	0,685	Valid	0,984
X15	258,1800	1021,644	0,716	Valid	0,984
X16	258,1200	1020,349	0,639	Valid	0,984
X17	258,2100	1017,279	0,652	Valid	0,984
X18	258,1600	1021,004	0,677	Valid	0,984
X19	258,2100	1025,986	0,692	Valid	0,984
X110	258,1300	1018,538	0,671	Valid	0,984
X111	258,1800	1020,856	0,738	Valid	0,984
X112	258,0100	1023,162	0,666	Valid	0,984
X113	258,1200	1024,531	0,660	Valid	0,984
X114	258,1900	1017,549	0,710	Valid	0,984
X115	257,9600	1027,615	0,514	Valid	0,984
X116	258,0700	1027,237	0,509	Valid	0,984
X117	258,0000	1026,808	0,562	Valid	0,984
X118	258,2100	1020,531	0,634	Valid	0,984
X119	258,1000	1024,798	0,688	Valid	0,984
X120	258,1300	1023,852	0,642	Valid	0,984
X121	258,0900	1023,032	0,643	Valid	0,984
X122	258,0300	1025,201	0,597	Valid	0,984
X123	258,2500	1022,068	0,531	Valid	0,984
X124	258,1500	1020,048	0,616	Valid	0,984
X125	258,0800	1021,751	0,653	Valid	0,984
X126	258,1400	1023,697	0,632	Valid	0,984
X127	258,1300	1020,801	0,750	Valid	0,984
X128	258,0700	1023,904	0,723	Valid	0,984
X129	258,1800	1024,513	0,635	Valid	0,984
X130	258,2000	1027,192	0,555	Valid	0,984
X21	258,0300	1025,928	0,560	Valid	0,984
X22	258,0400	1019,918	0,703	Valid	0,984

Item-Total Statistics					
Responden	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Remark	Cronbach's Alpha if Item Deleted
X23	258,0600	1020,340	0,700	Valid	0,984
X24	257,9900	1022,454	0,622	Valid	0,984
X25	257,9900	1020,535	0,709	Valid	0,984
X31	258,1500	1023,684	0,681	Valid	0,984
X32	258,2200	1018,598	0,722	Valid	0,984
X33	258,1600	1016,156	0,762	Valid	0,984
X34	258,0600	1021,835	0,751	Valid	0,984
X35	258,0500	1019,018	0,775	Valid	0,984
X36	258,1700	1023,112	0,553	Valid	0,984
X37	258,1600	1022,378	0,641	Valid	0,984
X38	258,1000	1019,606	0,788	Valid	0,984
X41	258,3300	1012,062	0,659	Valid	0,984
X42	258,3000	1015,909	0,630	Valid	0,984
X43	258,2200	1020,880	0,682	Valid	0,984
X44	258,1800	1023,402	0,645	Valid	0,984
X45	258,1500	1023,503	0,687	Valid	0,984
X51	258,0600	1023,350	0,682	Valid	0,984
X52	258,0900	1025,901	0,603	Valid	0,984
X53	258,1700	1022,971	0,746	Valid	0,984
X54	258,1500	1020,351	0,670	Valid	0,984
X55	258,0700	1020,167	0,655	Valid	0,984
X56	258,2600	1023,386	0,552	Valid	0,984
X61	258,1000	1027,303	0,589	Valid	0,984
X62	258,2000	1022,040	0,676	Valid	0,984
X63	258,0400	1023,554	0,744	Valid	0,984
X64	258,2100	1020,491	0,750	Valid	0,984
X65	258,1500	1024,290	0,642	Valid	0,984
X66	258,1400	1023,718	0,673	Valid	0,984
X67	258,1200	1019,238	0,650	Valid	0,984
X68	258,1200	1019,844	0,685	Valid	0,984
X69	257,9200	1026,721	0,628	Valid	0,984
X71	258,0600	1020,279	0,723	Valid	0,984
X72	258,0000	1025,111	0,651	Valid	0,984
X73	258,0900	1020,689	0,727	Valid	0,984
X74	258,0700	1026,369	0,531	Valid	0,984
X75	258,0900	1021,436	0,707	Valid	0,984
X76	258,1900	1022,802	0,715	Valid	0,984
X77	258,0400	1024,059	0,700	Valid	0,984
X78	258,0600	1022,158	0,716	Valid	0,984
X81	257,9600	1021,817	0,667	Valid	0,984
X82	257,9500	1019,866	0,716	Valid	0,984
X83	258,1100	1017,392	0,741	Valid	0,984
X84	258,1000	1019,808	0,734	Valid	0,984
X85	258,0500	1021,523	0,631	Valid	0,984

In Table 5 show on that the data variables Y to X85 are valid.

- **Normality test**

Table 6. Normality test

No	Variable	Variable Name	Result
1.	Y	E-Learning	Normal
2.	X1	System Performance	Normal
3.	X2	System Security	Normal
4.	X3	E-Readiness	Normal
5.	X4	Behavior	Normal
6.	X5	Management	Normal
7.	X6	Effective	Normal
8.	X7	Efficient	Normal
9.	X8	Organizing Institution	Normal

Hypothesis:
H0: Data Distributed Normal
H1: Data is not Normal Distribution

- **Correlation and Determination**

Table 7. Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,787[a]	,619	,585	1,532	1,790

a. Predictors: (Constant), X8, X4, X1, X2, X5, X7, X3, X6
b. Dependent Variable: Y

- **R (Correlation Coefficient)**
  The amount of R = 0.787 shows the correlation between e-Learning variables (Y) with System Performance (X1), System Security (X2), e-Readiness (X3), Behavior (X4), Management (X5), Effective (X6), Efficient (X7), Organizing Institution (X8) of 0.787 (78.7%)

  So the level of relationship between e-Learning variables (Y) as the dependent variable with independent variables consists of System Performance (X1), System Security (X2), e-Readiness (X3), Behavior (X4), Management (X5), Effective (X6), Efficient (X7), Organizing Institution (X8) of 0.787 (78.7%).

- **Adjusted R Square (R2 or coefficient of determination)**
  Adjusted R Square size = 0.585 shows 58.5% variation of e-Learning variable (Y) with System Performance (X1), System Security (X2), e-Readiness (X3), Behavior (X4), Management (X5), Effective (X6), Efficient (X7), Organizing Institution (X8) while 41.5% due to other variations.
- **Standard Error**

Large Std Error of the Estimate = 1.532 shows a variation of 1.532 around the regression line. The smaller the value of Std. Error of the Estimate will make the regression model more precise in predicting the dependent variable.

- **Simultaneous Significance Test**

Table 8. Anova

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	346,954	8	43,369	18,476	,000[b]
	Residual	213,606	91	2,347		
	Total	560,560	99			

a. Dependent Variable: Y
b. Predictors: (Constant), X8, X4, X1, X2, X5, X7, X3, X6

Hypothesis:
Ho: There is no relationship between E-Learning variables (Y) with System Performance (X1), System Security (X2), E-Readiness (X3), Behavior (X4), Management (X5) Effective (X6), Efficient (X7), Organizing Institution (X8).
H1: There is a relationship between E-Learning variables (Y) with System Performance (X1), System Security (X2), E-Readiness (X3), Behavior (X4), Management (X5), Effective (X6), Efficient (X7), Organizing Institution (X8).

The test uses the F test
Fcount = 18,476 with comparison Ftable = F [0.05 (8.91)] = 2.31

Test result :
Because F count> Ftable then Ho is rejected

Conclusion:
There is a relationship between E-Learning variables (Y) with System Performance (X1), System Security (X2), E-Readiness (X3), Behavior (X4), Management (X5), Effective (X6), Efficient (X7) , Organizing Institution (X8).

Testing using Sig
Sig = 0,000 with comparison $\alpha = 0.05$

Test result :
Because Sig $<\alpha$ Ho is rejected

Conclusion:
There is a relationship between E-Learning variables (Y) with System Performance (X1), System Security (X2), E-Readiness (X3), Behavior (X4), Management (X5), Effective (X6), Efficient (X7) , Organizing Institution (X8)

Table 9. Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2,200	1,265		1,739	,085		
	X1	,027	,103	,027	,265	,792	,407	2,459
	X2	,154	,102	,163	1,508	,135	,359	2,789
	X3	,313	,124	,324	2,515	,014	,252	3,970
	X4	,130	,089	,152	1,467	,146	,390	2,566
	X5	,051	,133	,051	,382	,704	,231	4,334
	X6	-,023	,151	-,022	-,154	,878	,210	4,756
	X7	,142	,126	,138	1,124	,264	,280	3,575
	X8	,067	,103	,075	,646	,520	,312	3,203

a. Dependent Variable: Y

Regression Statement:
Y = 2,200 + 0,027 X1 + 0,154 X2 + 0,313 X3 + 0, 130 X4 + 0, 051 X5 - 0,023 X6 + 0,142 X7 + 0,067 X8.
Or
e-Learning = 2,200 + 0,027 System Performance + 0, 154 System Security + 0,313 e-Readiness + 0,130 Behavior + 0, 051 Management - 0,023 Effective + 0,142 Efficient + 0,067 Organizing Institution.

Of the seven independent variables included in the e-Learning variable regression model is not significant because the Sig> 0.05 value is only the e-Readiness variable is significant because Sig <0.05.
So it can be concluded that e-Learning variables are influenced by e-Readiness. Associated with respondents from several universities. Relationship (Y = 0.313 X3 or e-Learning = 0.313 e-Readiness).

- **Multikolonieritas Test**

Table 10. Multikolonieritas Test

Coefficientsa

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	X1	,407	2,459
	X2	,359	2,789
	X3	,252	3,970
	X4	,390	2,566
	X5	,231	4,334
	X6	,210	4,756
	X7	,280	3,575
	X8	,312	3,203

a. Dependent Variable: Y

Table 10 explains that of the eight independent variables in the e-Learning variable regression model (Y) with System Performance (X1), System Security (X2), e-Readiness (X3), Behavior (X4), Management (X5).), Effective (X6), Efficient (X7), Organizing Institution (X8) VIF value <10 means there is no multicollinearity.

Conclusion:
So the independent variable consists of E-Learning variables (Y) with System Performance (X1), System Security (X2), E-Readiness (X3), Behavior (X4), Management (X5), Effective (X6), Efficient (X7), the Organizing Institution (X8) does not indicate the existence of multicolonity.

- **Autocorrelation Test**

Table 11. Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,787[a]	,619	,585	1,532	1,790

a. Predictors: (Constant), X8, X4, X1, X2, X5, X7, X3, X6
b. Dependent Variable: Y

The Durbin-Watson (DW) value = 1.790 compared to the table value with α = 5%, the number of independent variables k = 8 and the number of samples n = 100, then obtained DW tables: dl = 1,5060 and du = 1,8498 with Boundaries bottom: 4 - du = 4-1,8498 = 2,1502 and upper limit: 4-dl = 4-1,5060 = 2,494.

It means there is no clarity of autocorrelation (without decision) because if dL <DW <dU or (4 - dU) <DW <(4 - dL) (result of calculation: Dl (1,5060) <1,790 <1,8498).

- **Uji T**

In this T test there are two courses which are tested based on data before and after the implementation of e-Learning, namely Information System Audit Courses and Knowledge Management Courses.

Table 12. Pair Samples Statistics Before and After the Application of e-Learning for Information System Audit Courses

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before	67.83	12	18.925	5.463
	After	80.50	12	4.442	1.282

Table 12 explains the application of e-Learning for Information System Audit Courses experiencing an increase in the average value of 12.67 results from 67.83 to 80.50.

Table 13. Level of Relationship between Average values for Information System Audit Courses

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Before After	12	.793	.002

In table 13 describes the level of relationship value The average value of the System Audit Course Information before and after applied e-learning is 0.793 or 79.3%.

Table 14. Pair Samples Test for Information System Audit Courses

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Before After	-12.667	15.640	4.515	-22.604	-2.730	-2.806	11	.017

Hypothesis :
H0 : There is no difference in the average value of the Information System Audit course before and after e-Learning is applied
H1 : There are differences in the average value of Information System Audit courses before and after e-Learning is applied

Data Testing:
Using Sig
Sig. (2-tailed) = 0.017, then Sig = 0.0085 with alpha comparison = 0.05 = 5%

Test result
Because Sig <alpha, then H0 is rejected

The conclusion:
There is a difference in the average value of Information System Audit courses before and after e-Learning is applied.

4 Conclusion

From research on the role of e-Learning, conclusions can be drawn based on the formulation of the problem of (1) measuring effective and efficient learning using e-Learning, namely there is a relationship between 80% e-Learning and 97% efficient e-Learning, (2) E-Learning is active has an overall impact based on Behavior (79%), includes honesty (60%), Trust (84%), Messanger (84%) and Intelligence (84%).

References

[1] U. D. Negara *et al.*, “No Title,” vol. 4, no. 1, pp. 1–12, 1945.

[2] “https_economictimes_indiatimes_com_definition_e_learning.pdf.” .

[3] J. L. Torrecilla and J. Romo, “Data learning from big data,” *Stat. Probab. Lett.*, vol. 5, no. xxxx, pp. 1–5, 2018.

[4] W. Zhang and J. M. Rieckmann, “E-Learning Pedagogical Strategy : Present and Trends in Scientific Research,” *2018 9th Int. Conf. Inf. Technol. Med. Educ.*, pp. 480–483, 2018.

[5] “2015_Expert Search Engine and Content Generation in E.” .

[6] B. Klimova and P. Maresova, “Cloud Computing and E-Learning and Their Benefits for the Institutions of Higher Learning,” pp. 75–78, 2016.

[7] S. Ahmed, “The Role of e-Learning to Face the Challenges of the Century في مواجهة تحديات القرن دور التعليم الإلكتروني,” p. 7695, 2013.

[8] D. Eg and O. Hvkpdw, “(IILFLHQW 0HWKRG IRU) DFH 5HFRJQLWLRQ DQG , WV 5ROH LQ 6XSSRUWLQJ (OHDUQLQJ 6 \ VWHPV,” pp. 5–8, 2015.

[9] “S. Arora, J. Maini, P. Mallick, P. Goel and R. Rastogi, ‘Efficient E-learning management system through web socket,’ 2016 3rd International Conference on Computing for Sustainable Global Development (INDIACom) , New Delhi, 2016, pp. 509-512.,” p. 7724316, 2016.

[10] M. B. Yel, “E-Learning Model for Equivalency Education Program in Indonesia,” no. September, pp. 19–21, 2017.

[11] H. Jusuf and A. Azimah, “E-learning for facilitating learning,” no. Icic, pp. 1–4, 2016.

[12] A. Kanimozhi, “An Adaptive E-Learning Environment Centred On Learner ’ s Emotional Behaviour.”

[13] C. P. Herath, “Stakeholders ’ Psychological Factors Affecting E- Learning Readiness in Higher Education Community in Sri Lanka,” pp. 168–173, 2015.

[14] A. Nortvig, A. K. Petersen, and S. H. Balle, “A Literature Review of the Factors Influencing E-Learning and Blended Learning in Relation to Learning Outcome , Student Satisfaction and Engagement,” vol. 16, no. 1, pp. 46–55, 2018.

[15] S. Liaw and G. Chen, “Surveying instructor and learner attitudes toward e-learning,” vol. 49, pp. 1066–1080, 2007.

[16] C. R. Bomhold, “Educational use of smart phone technology undergraduate university students,” 2005.