

Adoption of Computer Assisted Instruction in Teaching Business Education Courses at Tertiary Institutions in North-East Nigeria

Umar Inuwa¹ and Agatha Samson²

Abstract

The study examined the intention of business education lecturers for adopting computer assisted instruction in teaching business education courses at tertiary institutions in North-East Nigeria. A survey research design was adopted where 120 business education lecturers were randomly selected from twelve tertiary institutions offering business education in North-Eastern Nigeria. A structured questionnaire was used as instrument for data collection. The data collected was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results revealed that perceived usefulness, perceived ease of use and computer self-efficacy had significant and positive relationship with adoption of CAI in teaching business education courses at tertiary institutions in North-East Nigeria. By implications, business education lecturers believed that technology usefulness, ease of use and their self-efficacy in computer are important determinants of CAI adoption. This study suggested that predominant use of traditional lecture method among business education lecturers should be discouraged and encourage the use of modern technologies, particularly computer assisted instruction in teaching business education courses because it is an interactive instructional technique that allow students to fully participate in the learning process and makes the learning environment more engaging for both students and teachers unlike the traditional lecture method that is less effective in improving students' learning outcomes and students are less involved in the learning process.

Keywords: Computer Assisted Instruction, Business Education, Tertiary Institutions

Introduction

Business education is an aspect of vocational education that prepares individual with relevant knowledge, skill, and attitude to become self-reliant citizen. Business education equips students with appropriate knowledge, skills, and value for performing specific roles in order to become a self-reliant and to develop their intellectual capacity which would help them to make informed decisions in all sphere of life. (Ajisafe, Bolarinwa & Tuke, 2015). It is one of the tertiary institutions program in Nigeria design to provide learners with desirable skills for employment and prepare them to function intelligently as consumers and citizens in a business economy (Okoli, 2016). Therefore, business education is the course of study at tertiary institutions that focused on competencies and knowledge needed by individuals to become meaningful and self-reliant citizen within society (Etonyeaku, 2012).

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Business education lecturers in Nigerian tertiary institutions adopted several instructional techniques for instructional delivery (Ajisafe, Bolarinwa & Tuke, 2015). The technique adopted by business educators is determined by the number of factors such as readiness of the lecturers to adopt an instructional method, nature of the course and students' level (Samuel, Adenubi & Olubode, 2018). Even though the use of information and communication technology (ICT) in schools has been one of the greatest innovations in teaching and learning but the huge investment by government in modern technologies, particularly in tertiary institutions is not yielding the desired results because lecturers in Nigeria are still left behind in terms of utilizing ICT facilities because most of them prepare the use of conventional lecture methods (Okolocha & Nwadiani, 2019). This is in line with argument of Iheonunekwu, Kevin and Uche (2019) that business educators are predominantly using the traditional instructional method where lecturer dominates the class and does not allow students to fully engage in the learning process. Previous studies (see, for example, Abimbola & Abidoye, 2018; Hossain & Ahmad, 2016) have observed that traditional instructional approach is less effective in improving students' learning outcomes. This is due to the fact that in traditional instructional approach, students are less involved in the learning process. Scholars (see, for example, Musa, Inuwa & Bello, 2020; Iheonunekwu, Kevin & Uche, 2019) suggested the departure from the traditional instructional approach to a more interactive spirally structured approach where students will fully participate in the learning process.

Computer assisted instruction (CAI) is one of the interactive instructional technique that shifts a learning approach from teacher-centred to student-centred where students are allowed to fully participate in the learning process, improves their performance, retention and learning rate, it also makes the learning environment more engaging for both students and teachers (Usman, & Madudili, 2020). Similarly, Musa et al. (2020) suggested that business educators should adopt the use of ICT in teaching and learning process because ICT creates new opportunities for teachers and learners. It improves the efficiency and productivity of teachers and makes it easier for learners to collaborate and work in team. Some studies (Fokides, 2017; Summak, & Baglibel, 2018) on the hand, maintained that perceived ease of use, perceived usefulness and computer self-efficacy are factors that lead to the utilization of ICT facilities in teaching learning. Nonetheless, no published study was found to focus on perceived ease of use, perceived usefulness, computer self-efficacy and adoption of computer assisted instruction in teaching business education courses. Therefore, the present study intends to investigate the intention of business education lecturers for adopting computer assisted instruction in teaching business education courses at tertiary institutions in North-East Nigeria.

Purpose of the Study

The study assessed the adoption of computer assisted instruction in teaching business education courses at tertiary institutions in North-East Nigeria. Specifically, the study examined:

1. The relationship between perceived ease of use and adoption of CAI in teaching business education courses.
2. The relationship between perceived usefulness and adoption of CAI in teaching business education courses.
3. The relationship between computer self-efficacy and adoption of CAI in teaching business education courses.

Hypotheses

Based on the objectives of the study the following hypotheses are formulated to guide the study:

- H1:** There is a significant relationship between perceived ease of use and adoption of CAI in teaching business education courses.
- H2:** There is a significant relationship between perceived usefulness and adoption of CAI in teaching business education courses.
- H3:** There is a significant relationship between computer self-efficacy and adoption of CAI in teaching business education courses.

Significance of the Study

The outcomes of the study will be significance to the business education students of tertiary institution because a good instructional technique has a positive impact on the students' learning outcome. Also the outcomes of this study will be importance to stakeholders in tertiary institutions, particularly, business education lecturers, supervisory agencies of tertiary institutions like national universities commission and national commission for colleges of education in terms of adopting interactive instructional technique in teaching business education courses. It is also expected that the performance, retention and learning rate of business education students of tertiary institution will be boost.

Literature Review

Perceived Ease of Use

The term ease of use refers to the amount of effort user's need to use the system (Sondakh, 2017). It can also view as the degree to which a teacher expected the use of computer technology to be free of effort (Ma, Andersson, & Streith, 2015). On the other hand, King (2018) defined perceived ease of use is the extent to which a person believes that the use of given technology will be free from effort. Hao, Dennen & Mei (2016) argued that perceived ease of use is a significant determinant technology adoption. Similarly, several studies established the relationship between perceived ease of use and new technology adoption for example, Samuel, Onasanya, and Olumorin (2018) in their study of perceived ease of use and perceived usefulness of using mobile technologies. among university lecturers proved that a positive and significant relationship existed between perceived ease of use and utilization of mobile technologies among university lecturers in Nigeria. Similar finding was reported in the study of Sugandini et al. (2018) that technology adoption is significantly affected by perceived ease.

Perceived Usefulness

Perceived usefulness is one of the constructs of technology acceptance model that has a significant influence on technology use. Perceived usefulness is perception of individual that using technology will lead to performance improvement (Chong, 2013). According to Ma, Andersson, and Streith, (2015) perceived usefulness is the teacher's belief that using technology would enhance the job performance of teacher within the school context. The relationship between perceived usefulness and technology use has always

been a topic of interest in the fields of research. A number of studies have established the relationships between perceived usefulness and use of new technology, but no study has focused solely on perceived usefulness and adoption of CAI in teaching business education courses. Therefore, it is hoped that the present research can provide further insights on the phenomenon. Hamid et al. (2016) in the context of Malaysia investigated the effects of perceived usefulness and perceived ease of use on intention to use e-government in public schools. The study found that perceived usefulness was a significant predictor of intention to use e-government. In the context of in Hungary Nagy (2018) conducted a study on online video usage and the study proved empirically that perceived usefulness had a direct effect on the video usage.

Computer Self-Efficacy

Scholars viewed computer self-efficacy in different perspectives for instance, Sarfo, Amankwah and Konin (2017) defined computer self-efficacy as person confidence and belief to use the computer skills and knowledge already possess to execute a particular task. Teachers' computer self-efficacy is a teachers' confidence and belief to use computer and technology related skills to facilitate instructional delivery (Teo & Koh, 2010). Several studies established the relationship between computer self-efficacy and technology adoption. For example, Yau and Leung (2018) in the context of Hong Kong conducted a study on self-efficacy and attitudes towards the use of technology in learning. They found a significant and positive relationship between self-efficacy and attitudes towards the use of technology in learning.

Methodology

This study used a survey research design to investigate the intention of business education lecturers for adopting computer assisted instruction in teaching business education courses at tertiary institutions in North-East Nigeria. A survey method is used when a researcher administered a survey or questionnaire to a sample or to the entire population in order to describe the opinions, feelings, and thoughts of the respondents about a particular situation (Creswell 2012). In survey method the researchers collect and analyze quantitative data to ascertain the relationship between the variables of interest (Saunders et al., 2009). This study collected and analyzed quantitative data from business education lecturers regarding their intention to adopt computer assisted instruction in teaching business education courses at tertiary institutions. Hence, a survey method is appropriate for achieving the objective of this study.

Population and Sample

The target population of this study comprised 226 business education lecturers from twelve tertiary institutions offering business education in North-Eastern Nigeria. The business education lecturers were considered in this study because they are the people handle/teach business education courses at the institutions under investigation. Hence, they are in better position to provide the information needed for this study.

The sample was statistically determined using GPower, a statistical procedure used for determining the appropriate minimum sample size required for a study, with respect to the number of the predicting variables. Thus, to determine the minimum sample size required for this study, considering the number of the predicting variables, a priori power analysis was conducted using the G*Power 3.1.9.2 software application (Faul, Erdfelder, Lang, & Buchner, 2017). A priori analysis was based on these parameters: Power (1- β err prob;

0.95), an alpha significance level (α err prob; 0.05), medium effect size f^2 (0.15), the number of the predictors are three based on the research framework. This statistical test is commonly used in the social and behavioral sciences (Faul et al., 2017). Hence, it was appropriate for this study. From the outcome of the analysis, a minimum of 110 sample is required for this study. The sample was increased to 120 in order to have equal number of respondents from each tertiary institution under investigation and to avoid non-response problem and sample size error as suggested by Salkind in 2018, that is, 10 business education lecturers were drawn from each tertiary institutions offering business education in North-Eastern Nigeria to form the sample size. Simple random sampling technique was used in this study, because this sampling technique is believed to produce sample which is free from bias (Sekaran & Bougie, 2016). Following this argument, the study randomly selected 120 business education lecturers. Out of 120 questionnaires distributed, 115 were retrieved, representing 96 % response rate. The response rate is significant. The treatment of missing data was conducted as suggested by Hair, Hult, Ringle and Sarstedt (2013). No outliers case was detected, the final data for analysis become 115 cases.

Measurement

The instrument, comprising of four constructs was adapted from the prior studies, for instance, Adoption of CAI was measured with 10 items and they were adapted from Gress, Fior, Hadwin, and Winne (2010) and were tested and found to be reliable by Musa et al. (2020). Perceived Usefulness consist of 5 items developed by Adams, Nelson, and Todd (1992) and tested by Rahmat, (2019); Lanlan, Ahmi, and Popoola (2019). The items of Perceived Ease of Use were adapted from Rahmat, (2019); Lanlan, et al. (2019). The construct was represented by 5 items and found to valid and reliable. The construct computer self-efficacy was represented by 6 items adapted from Compeau and Higgins (1995). The construct was tested by Howard (2014) for internal consistency reliability. In this study, the Likert scale was adopted for all the items, the respondents were asked to indicate their responses to each item on a five-point scale. Krosnick and Fabrigar (1997) opine that a scale between five and seven points is more reliable than higher or lower scales and a scale with no midpoint may increase the measurement error. Similarly, Dawes (2008) states that a five or seven scale is likely to produce better results.

Analysis Method

Due to the small sample size of the study, Structural Equation Modeling (SEM) through Partial Least Squares (Smart PLS 3.3.3.) was used to analyze the data collected as suggested by Ringle, Da Silva, and Bido (2015).

Data Analysis and Findings

Goodness of Measurements

This study established the construct validity using the two-step approach recommended by Hair, Black, Babin and Anderson (2017). Firstly, the convergent validity was assessed by this study, followed by the assessment of discriminant validity. Loadings, average variance extracted (AVE) and reliability were used to assess the convergent validity while discriminant validity was assess using Fornell-Larcker criterion (see, table 1 & 2). The construct validity is established if the loadings are above 0.7, average variance extracted above 0.5, composite reliability (CR) and Cronbach alpha above 0.7 (Hair et al., 2017; Nunnally & Bernstein, 1994).

Table 1 Result of CFA for measurement model

Constructs	Items	Loadings	Alpha	CR	AVE
Adoption of CAI	ACAI1	0.738	0.901	0.920	0.592
	ACAI2	0.771			
	ACAI3	0.816			
	ACAI4	0.789			
	ACAI5	0.800			
	ACAI6	0.736			
	ACAI9	0.723			
Computer Self-efficacy	ACAI10	0.774			
	CSE1	0.791	0.912	0.932	0.695
	CSE2	0.859			
	CSE3	0.893			
	CSE4	0.845			
	CSE5	0.771			
Perceived Ease of Use	CSE6	0.838			
	PEU2	0.870	0.814	0.889	0.728
	PEU3	0.862			
Perceived Usefulness	PEU4	0.827			
	PU1	0.883			
	PU2	0.935			
	PU3	0.927	0.947	0.959	0.825
	PU4	0.902			
	PU5	0.892			

The loadings of ACAI7, ACAI8, PEU1 and PEU5 are less than 0.50 and they were deleted (Hair et al., 2013).

This study established discriminant validity using the square root of AVE of each latent construct (Hair et al., 2017). Therefore, in this study, discriminant validity was assessed by comparing the square root of the AVE for each construct with the correlations presented in the correlation matrix. Table 2 showed the results of Fornell-Larcker Criterion assessment with the square root of AVE of each constructs. The square root of AVE in bold is greater than its correlation with any other constructs. Hence, it is concluded that discriminant validity of the constructs has been established (Hair et al., 2017).

Table 2 Discriminant validity of construct

	ACAI	CSE	PEU	PU
ACAI	0.769			
CSE	0.560	0.834		
PEU	0.558	0.448	0.853	
PU	0.516	0.502	0.484	0.908

ACAI= Adoption of CAI, CSE= Computer Self-efficacy, PEU= Perceived Ease of Use, PU= Perceived Usefulness.

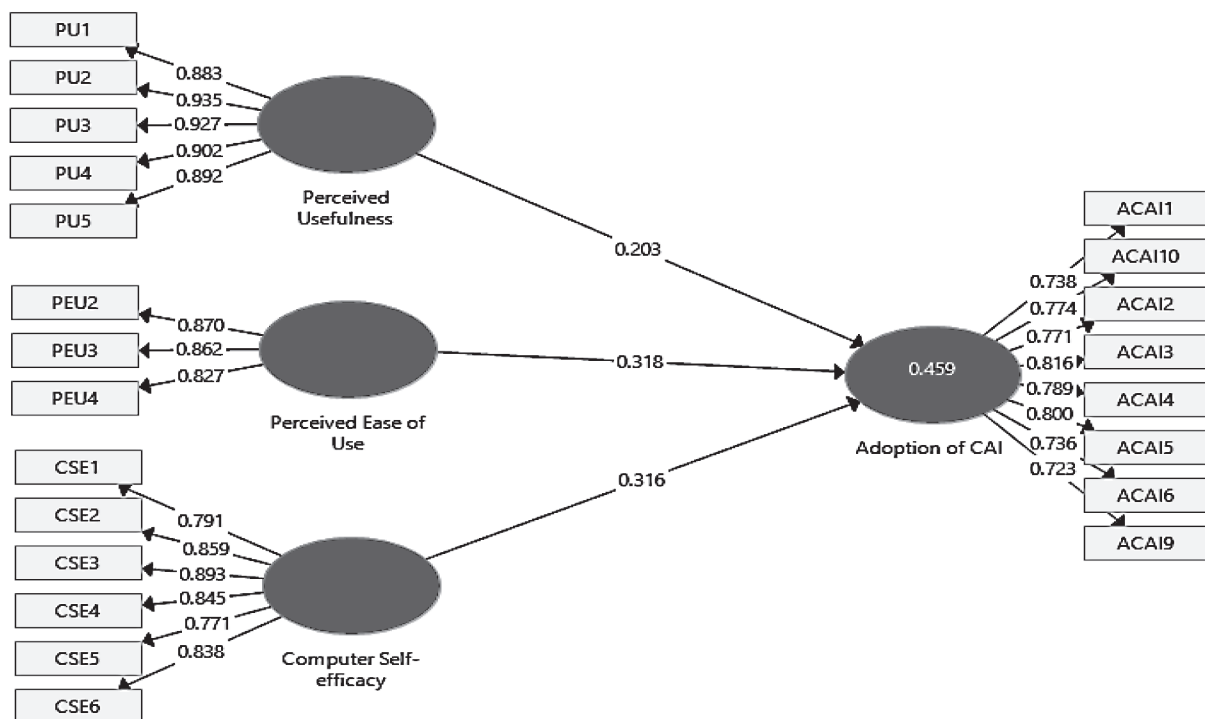
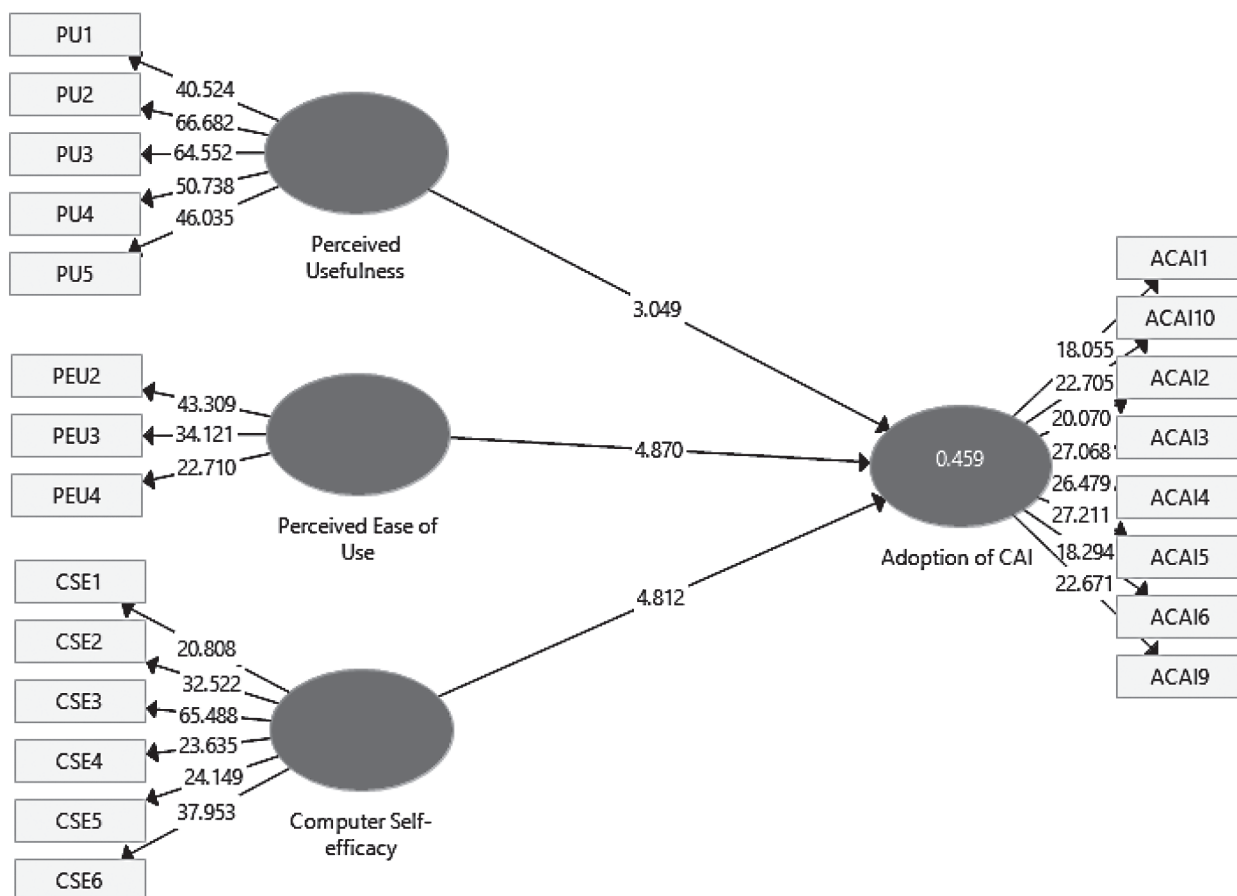
**Figure 1:** Measurement Model

Table 3 and Figure 2 shows the result generated with the help of Smart PLS 3.3.3. The results indicate the p-value, t-value, coefficient value. Based on p-value and t-value the hypothesis decision has been made. The result was obtained from the bootstrapping procedure with 5000 sampling iterations for 115 cases as recommended by Hair et al. (2017). The statistical evidence documented in table 3 revealed that the relationship between perceived usefulness and adoption of CAI in teaching business education was found to be positively significant ($\beta = 0.203$, $t = 3.049$, $p < 0.05$). This suggests that the hypothesized relationship between the two constructs was supported. Similarly, the relationship between perceived ease of use and adoption of CAI was found to be positively significant ($\beta = 0.318$, $t = 4.870$, $p < 0.05$). The hypothesis 2 was supported. Again, computer self-efficacy has confirmed to have a significant and positive relationship with adoption of CAI in teaching business education ($\beta = 0.316$, $t = 4.812$, $p < 0.05$). The hypothesized relationship between the two constructs was supported.

Table 3 Hypotheses testing

Hypotheses	Std. Beta	T value	P value	Decision
PU->ACAI	0.203	3.049	0.002	Supported
PEU->ACAI	0.318	4.870	0.000	Supported
CSE->ACAI	0.316	4.812	0.000	Supported

**Figure 2:** Structural Model

Discussion

This study proved that perceived ease of use has a significant and positive relationship with adoption of CAI in teaching business education courses at tertiary institutions. The finding suggests that, when business education lecturers believe that the use of CAI in teaching business education courses is free from effort, they will develop positive attitude towards adoption of CAI in their teaching job. The findings concurred with the findings of existing studies such as Samuel et al. (2018) that a positive and significant relationship existed between perceived ease of use and utilization of mobile technologies among university lecturers in Nigeria. The finding is in line with the study of Sugandini et al. (2018) that technology adoption is significantly

affected by perceived ease. Similar finding was reported by Kazoka and Mwantimwa (2019) in the context of Tanzania that perceived ease of use is important predictor of the adoption of Web 2.0 technologies in teaching and learning. Also the finding is in agreement with the finding of Islami and Baumaspe (2021) that perceived ease of use has a positive and significant effect on online tutorial application usage.

The present study further proved that perceived usefulness has a significant and positive relationship with adoption of CAI in teaching business education courses at tertiary institutions. This finding suggests that business education lecturers had positive perception towards using CAI in teaching business education courses. The finding concurred with the finding of Samuel et al. (2018) who established a positive and significant relationship between perceived usefulness and utilization of mobile technologies among lecturers. The finding also agreed with the finding of the study of Hwa, Hwei and Peck (2015) in the context of Malaysia that a significant relationship existed between perceived usefulness and university students' intention to use Learning Management System. Similar finding was reported by Agufana (2021) in the context of Kenya. The findings also agreed with study of Hamid et al. (2016) that perceived usefulness was a significant predictors of intention to use e-government.

In addition, this study examined the relationship between computer self-efficacy and adoption of CAI in teaching business education courses. The study suggested that computer self-efficacy has a significant and positive relationship with adoption of CAI in teaching business education. This finding supported the finding of the study of Yau and Leung (2018) in the context of Hong Kong that there was a significant and positive relationship between computer self-efficacy and attitudes towards the use of technology in learning. The finding of the present study concurred with finding of Chinaza et al. (2015) who observed that a positive and significant relationship existed between computer self-efficacy and online learning readiness. Similar finding was reported by John (2013) in the context of Thailand that computer self-efficacy directly influenced the adoption of information technology. Similarly, the finding supported the finding of the study of Akpan (2018) that computer self-efficacy and attitude towards internet had a significant positive relationship.

Conclusion

The study investigated the intention of business education lecturers to adopt computer assisted instruction in teaching business education courses at tertiary institutions in North-East Nigeria. The study proved empirically that perceived usefulness, perceived ease of use and computer self-efficacy have a significant and positive relationship with adoption of CAI in teaching business education courses at tertiary institutions. The results indicate that business education lecturers believed that technology usefulness, ease of use and their self-efficacy in computer are important determinants of CAI adoption. Therefore, predominant use of traditional lecture method among business education lecturers of tertiary institutions should be discouraged and encourage the use of modern technologies, particularly computer assisted instruction in teaching business education courses because it is an interactive instructional technique that allow students to fully participate in the learning process and makes the learning environment more engaging for both students and teachers unlike the traditional lecture method that is less effective in improving students' learning outcomes and students are less involved in the learning process. Furthermore, departure from the traditional instructional approach to computer assisted instruction would facilitate the lecturers' instructional delivery, improve their efficiency and productivity and make it easier for learners to collaborate and work in team Which would lead to a better learning outcome.

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