



## Technology-Enhanced Learning (TEL) Platforms Among Undergraduates in Private Universities in Nigeria During Covid-19 Era

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### ABSTRACT

The current pandemic of COVID-19 has affected every activities of the world with educational institutions not exempted. The lockdown has also halted instructional activities in the four walls of classroom around the world. Hence, many educational institutions have resulted to embracing technology-enhanced learning (TEL) platform to sustain academic session and continue to engage in teaching-learning activities through WhatsApp, Google Classroom, Schoology and Zoom Video Conferencing tool. This study examined the awareness, access and reaction toward TEL. It is descriptive research of the survey methods and the instrument is a researcher-designed questionnaire validated by four lecturers in Al-Hikmah University, Ilorin. The questionnaire was pilot tested and the data collected was subjected to a reliability test of Cronbach Alpha which yielded 0.89. Five research questions and two hypotheses guided the conduct of this study. All research questions were answered through frequency, percentage, mean and standard deviation while hypotheses raised were test using chi-square. The findings revealed that the undergraduate student of private universities possess a high rate of awareness and can access leaning content in TEL platforms which justify the positive reaction. Hence, it is recommended that TEL should be embraced to bridge the gap created by the COVID-19 pandemic lockdown across the world.

### KEYWORDS

Technology-Enhanced Learning; Social Media; COVID-19; Higher Education; Nigeria.

## INTRODUCTION

The world over is currently encountering an unprecedented experience concerning the coronavirus (COVID-19) pandemic. Every system of the world has been put on hold due to the efforts to flatten the curve of spread which has led to months of the lockdown of activities. According to the World Health Organization (WHO, 2020), Coronavirus is a large family of viruses which may cause illness in animals or humans by promoting respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The current pandemic is about coronavirus called COVID-19. It has affected all the economic activities of the world ranging from businesses to education. In the case of the education industry, every teaching and learning activities have been suspended which has confined the students to their various homes and were not exposed to instructional activities during the confinement. In Nigeria, all educational activities were suspended through the enforcement of the lockdown by the Federal Government and consequently prevent teaching and learning activities from taking place. The COVID-19 pandemic has affected educational systems worldwide, leading to the near-total closures of schools, universities and colleges, and has affected over 60% of world's student population (United Nations Educational, Scientific and Cultural Organization, UNESCO, 2020) Before the COVID-19 lockdown experience, most educational institutions in Nigeria does not embrace the integration of technologies for delivery of instruction, however, some lecturers or instructors do, at some rare instance, integrate it.

The advent of the COVID-19 and its lockdown approach has awakened the 'giant' in most instructors and educational administrators to imbibe the integration of technologies for pedagogical objectives. The techniques to be adopted to continue the delivery of instruction to students at their various homes due to the lockdown enforcement beam a searchlight to Technology-Enhanced Platforms for both teaching and learning processes. UNESCO (2020) is supporting countries in the efforts to mitigate the immediate impact of school closures, particularly for more vulnerable and disadvantaged communities, and to facilitate the continuity of education for all through remote learning. The objective of continuity of instructional delivery to students through remote learning culminates the Technology-Enhanced Learning Platforms.

The concept of Technology-Enhanced Learning (TEL) Platform is not new to the instructional technology field and it has remained a concept that houses so many other approaches that relate to electronic means of learning. The introduction of technology into learning is to interface between instructions and learning style of student moderated the pedagogical skill of the teacher. The Technology-Enhanced Learning Platforms has changed the ways learners and professors connect, communicate, collaborate and create knowledge for learning and teaching both on campus and in blended and online learning spaces (Jacobsen, Brown, & Lambert, 2013). The application of TEL to learning possess certain characteristics which present learning to be ubiquitous, assign role the role of the organizer to the learner,

promotes lifelong learning process, makes learning to take place in a community by making it informal (Schneckenberg, Ehlers and Adelsberger, 2011). The TEL environment supports experiences enabled with technology to promote mobility of instruction and give leverage to learn voluntarily with self-pace. TEL refers to the support of teaching and learning through the use of technology synonymously with e-learning to enhance the possibility of supporting and improving the quality of instruction (O'Donnell & O'Donnell, 2015).

Technology-Enhanced Learning promotes learning activities through collaborations and interactions in accessing content developed for collaborative knowledge sharing system as a supplement for learning to improve the quality and enrich the learning environment (Sherly & Uddin, 2010). The TEL environment promotes four components in actualizing the specifics of education. TEL is used to enrich the quality of instruction; to evaluate the learning objectives, to implement instructional strategies and to motivate learners for the attainment of educational goal and self-reliance. Wang and Kinuthia (2004) present an illustrate the components of the TEL environment reflecting associated activities in the bid to display the relationship between the four core components of a learning environment and the characteristics of a technology-enhanced learning environment

The characteristic of TEL is synchronized with components of the learning environment to develop a core component for Technology-Enhanced Learning Environment. The components of the learning environment are learning goals, people, resources, and strategies in a dynamic system which the characteristic of TEL are using technology; to motivate people, to enrich learning resources, to implement learning and instructional strategies, and to assess or evaluate learning goals (Wang & Kinuthia, 2004). The synchronization of the characteristic of TEL with the components of the learning environment gives a pointer to the relationship that existed between the two concepts. Hence, to enrich the learning environment, technology serves as an enhancement to motivate learners, present contents through well-designed learning resources that focus on the attainment of a particular task.

The application of technology to enhance learning environment requires a clear demarcation of implementing instructional strategies to fulfil the goal of teaching and learning process. Furthermore, the relationship between TEL and learning environment premise on using technology to assess the extent of learning performance of the learners and at the same time evaluate the degree at which learning goal could be achieved. Conclusively, Wang and Kinuthia (2004) assert that technology-enhanced learning environment reflects a good integration of technology and offers its learners a great favorable environment to learn and to achieve the learning goals.

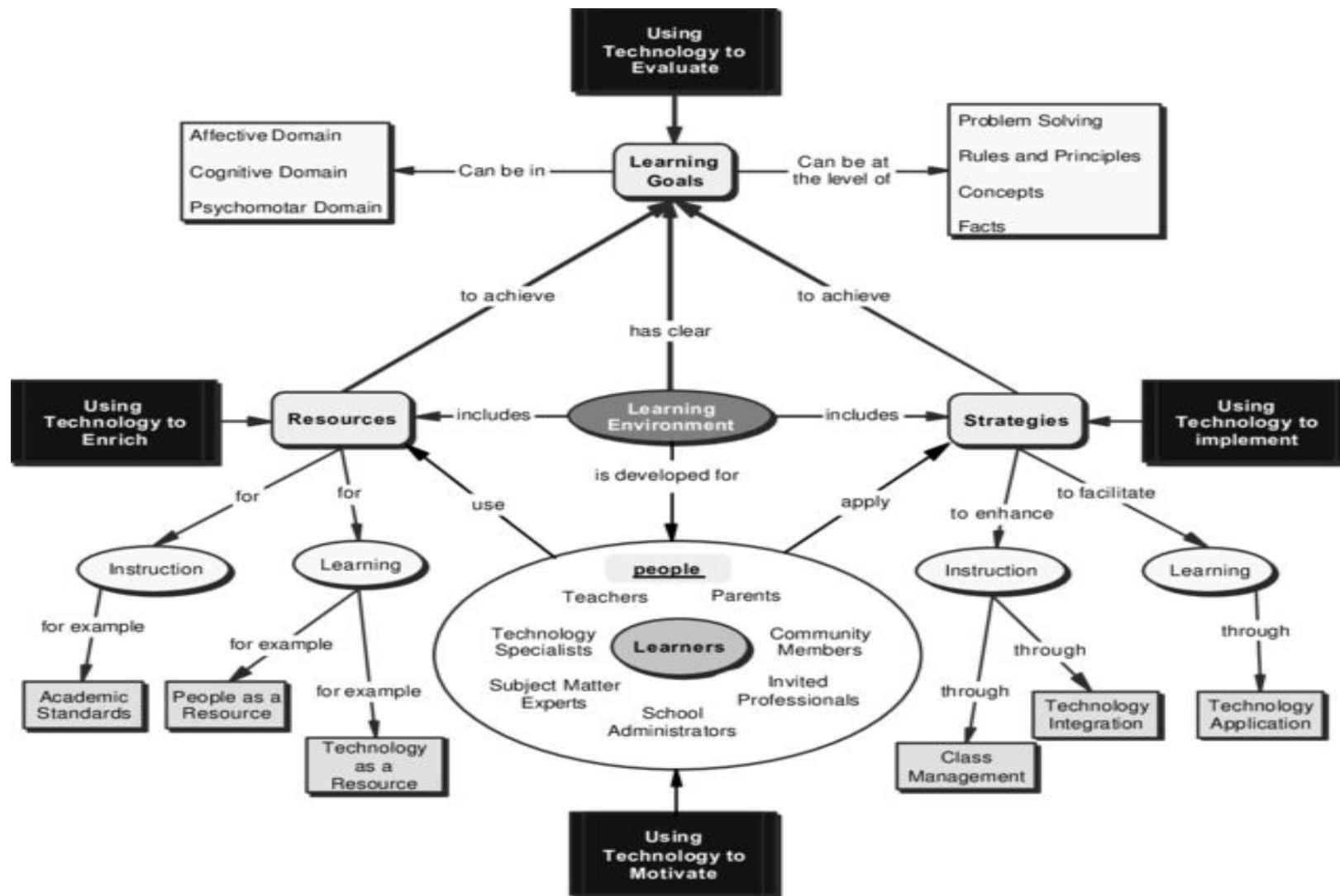


Figure 1: Core Components of a Technology-Enhanced Learning Environment (Wang and Kinuthia, 2004)

**Purpose of the Study**

1. Examine the awareness rate of technology-enhanced platforms for learning among undergraduates in private universities in Nigeria.
2. Investigate undergraduates' access learning content through technology-enhanced platforms in private universities in Nigeria.
3. Determine the reaction of undergraduates toward teaching through technology-enhanced platforms in private universities in Nigeria.
4. Assess the influence of student awareness rate on reaction towards technology-enhanced platforms in private universities in Nigeria.
5. Find out if undergraduates' access to learning content influences the reaction towards technology-enhanced platforms in private universities in Nigeria.

**Research Questions**

1. What is the awareness rate of technology-enhanced platforms for learning among undergraduates in private universities in Nigeria?
2. Does undergraduate access learning content through technology-enhanced platforms in private universities in Nigeria?
3. What is the reaction of undergraduates toward teaching through technology-enhanced platforms in private universities in Nigeria?
4. Does student awareness rate influence the reaction towards technology-enhanced platforms in private universities in Nigeria?
5. Do undergraduates' access to learning content influences the reaction towards technology-enhanced platforms in private universities in Nigeria?

**Research Hypotheses**

- H<sub>01</sub>: There is no significant difference between undergraduates' awareness rate and reaction towards technology-enhanced platforms in private universities in Nigeria.
- H<sub>02</sub>: There is no significant difference between undergraduates' access to learning content and reaction towards technology-enhanced platforms in private universities in Nigeria.

**METHODOLOGY**

This study adopted descriptive research of the survey method in which a researcher-designed questionnaire was used as the instrument to collect data. The target population was Faculty of Education undergraduate students and specifically, the sample size was drawn across all levels in the 15 functioning degree programs in the Faculty of Education, Al-Hikmah University, Ilorin, Nigeria. The total population of all undergraduate students in the Faculty of Education is 283 hence 64% of them translating to 181 responded to the questionnaire. The questionnaire was made up of four sections (A-D). Section A collates data on respondents' demography, section B measures awareness level on the technology-enhanced platform, section C collected responses on accessibility to learning content through the technology-enhanced platform while section D

gathered responses on the reaction of undergraduate students to technology-enhanced platform.

The mode of responses for section B is high, moderate, low and zero while for sections C and D are strongly agree, agree, disagree and strongly disagree. The questionnaire was validated by three lecturers in the Faculty of Education, Al-Hikmah University, Ilorin and the content of the questionnaire was transformed into Google form for easy administration during this COVID-19 pandemic era. It was later pilot tested using split-half with the Faculty of Agriculture undergraduate students of Al-Hikmah University, Ilorin. The data collated was then subjected reliability test using Cronbach Alpha which yielded 0.92. The undergraduate students were taught through technology-enhanced platforms like WhatsApp, Schoology, Google Classroom and Zoom.

Undergraduate students access both e-note and audio-note through the WhatsApp, while the interactive session was also done through the WhatsApp and zoom video conferencing tool. The Schoology and Google Classroom were specifically used to conduct continuous assessment test for the students. Hence, the various means of instructional delivery is termed technology-enhanced platform. Five research questions were raised and two hypotheses stated to guide the conduct of the study. The research questions were answered using frequency, percentage, mean and standard deviation while the hypotheses were tested using Chi-square statistical component of the SPSS version 22.

## RESULTS

**Research Question1:** What is the awareness rate of technology-enhanced platforms for learning among undergraduates in private universities in Nigeria?

The awareness rate of undergraduate students is on the high side as most of the undergraduate students examined gave positive responses through strongly agree or agree to items in Table 1. For instance, comparing the mean and standard deviation reveals that all the standard deviations are lower compared to the means which implies that the responses tilted to the positive responses of strongly agree and agree. This then implies that the awareness rate of undergraduates on the technology-enhanced platform is very high.

Table 1: Frequency, Percentage, Mean and Standard Deviation Output for Awareness Rate on Technology-Enhanced Platform

SN	Item	High	Moderate	Low	Zero	Mean	SD
1	I am familiar with the use of technology for social networking communications with my friends	97 (53.6%)	66 (36.5%)	12 (6.6%)	6 (3.3%)	1.60	0.76
2	I do engage in technology-enhanced platforms to send messages to my friends	99 (54.7%)	65 (35.9%)	12 (6.6%)	5 (2.8%)	1.57	0.74
3	I am frequent in some learning groups attached to my social media accounts	96 (53.0%)	65 (35.9%)	17 (9.4%)	3 (1.7%)	1.60	0.73
4	I have been using technology-enhanced platforms before COVID-19 era	80 (44.2%)	77 (42.5%)	19 (10.5%)	5 (2.8%)	1.72	0.76
5	I started using technology-enhanced platforms during this COVID-19 era	54 (29.8%)	56 (30.9%)	29 (16.0%)	42 (23.2%)	2.32	1.13

**Research Question2:** Does undergraduate access learning content through technology-enhanced platforms in private universities in Nigeria?

Contents are easily accessed by undergraduate students in technology-enhanced platform as revealed in Table 2. The responses show that the standard deviation is low compared to the mean and it implies that the responses is to the positive side of the answers ticked by respondents on items 1-5. This indicates that undergraduate students were able to access all forms (e-note and audio-note) of content posted through the technology-enhanced platform. It can then be concluded that the accessibility to learning contents on the technology-enhanced platform is simple and easy.

Table 2: Frequency, Percentage, Mean and Standard Deviation Output for Accessing Learning Content in Technology-Enhanced Platform

SN	Item	SA	A	D	SD	Mean	Std. Dev
1	There are several contents online that can be accessed through technology-enhanced platforms	99 (54.7%)	79 (43.6%)	3 (1.7%)		1.47	0.53
2	I have been accessing learning contents through technology-enhanced platforms before COVID-19 era	106 (58.6%)	52 (28.7%)	22 (12.2%)	1 (0.6%)	1.55	0.73
3	Materials for some of courses can only be accessed through technology-enhanced platforms	111 (61.3%)	31 (17.1%)	34 (18.8%)	5 (2.8%)	1.63	0.88
4	I got to know that learning content can be accessed through technology-enhanced platform during this COVID-19 era	85 (47.0%)	54 (29.8%)	30 (16.6%)	12 (6.6%)	1.82	0.94
5	My lecturers have been encouraging us to access learning content through technology-enhanced platforms	76 (42.0%)	99 (54.7%)	3 (1.7%)	3 (1.7%)	1.63	0.61

**Research Question 3:** What is the reaction of undergraduates toward teaching through technology-enhanced platforms in private universities in Nigeria?

The reaction of the undergraduate students to the use of the technology-enhanced platform for both teaching and learning is to the positive side. The mean score compared with the standard deviation did not show a marked difference. The interpretation, therefore, suggests that the responses are towards the positivity of the items examined. The implication is that since the standard deviation is lower compared to the mean, the responses are to one side which is the strongly agree and agree that constitutes positive responses. The conclusion, therefore, is that undergraduate students' reaction to the technology-enhanced platform is to the positive side.



Table 3: Frequency, Percentage, Mean and Standard Deviation Output for Reaction towards Technology-Enhanced Platform

SN	Item	SA	A	D	SD	Mean	Std. Dev
1	It is always very tasking to learn through technology-enhanced platform	106 (58.6%)	49 (27.1%)	22 (12.2%)	4 (2.2%)	1.60	0.79
2	Learning through technology-enhanced platform makes instruction to be motivating	101 (55.8%)	53 (29.3%)	23 (12.7%)	4 (2.2%)	1.61	0.79
3	I am very much comfortable learning through technology-enhanced platform during this COVID-19 period	85 (47.0%)	42 (23.2%)	45 (24.9%)	9 (5.0%)	1.88	0.95
4	It is somewhat boring to receive instructional content through technology-enhanced platform	91 (50.3%)	28 (15.5%)	54 (29.8%)	8 (4.4%)	1.88	0.98
5	Audio note through technology-enhanced platform does not facilitates learning as expected	83 (45.9%)	36 (19.9%)	53 (29.3%)	9 (5.0%)	1.93	0.98
6	I felt more comfortable with e-note materials sent through technology-enhanced platform	80 (44.2%)	48 (26.5%)	38 (21.0%)	15 (8.3%)	1.93	0.99
7	Teleconferencing medium makes learning through technology-enhanced platform more interesting	92 (50.8%)	47 (26.0%)	31 (17.1%)	10 (5.5%)	1.77	0.93
8	Any of the medium of technology-enhanced learning creates distraction for students	73 (40.3%)	29 (16.0%)	74 (40.9%)	5 (2.8%)	2.06	0.96
9	I am always comfortable receiving instructions through any medium of technology-enhanced platform	85 (47.0%)	38 (21.0%)	50 (27.6%)	8 (4.4%)	1.90	0.96
10	Mode of interactions in any of the technology-enhanced platform helps in clarifying misconceptions	118 (65.2%)	23 (12.7%)	35 (19.3%)	5 (2.8%)	1.60	0.89

### Hypotheses Testing

H<sub>01</sub>: There is no significant difference between undergraduates' awareness rate and reaction towards technology-enhanced platforms in private universities in Nigeria.

Table 4: Chi-Square Output on Significant Difference between Awareness Rate and Reaction towards Technology-Enhanced Platform

	Value	df.	Asymp Sig, (2-Sided tail)	Significance Level
Pearson Chi-Square	309.292	240	.002	
Likelihood Ratio	212.060	240	.003	
Fisher's Exact Test	311.849			.002
Linear-by-Linear Association	8.937	1	.003	
No. of Valid Cases	180			

From Table 4, Pearson Chi-Square = 309.292, and  $p = .002$ . The null hypothesis is rejected, since  $p < 0.05$  ( $p = 0.002$ ). In conclusion therefore, there is strong evidence that awareness rate contributes to the reaction of undergraduate students toward technology-enhanced platform for learning. Hence, the null hypothesis is rejected.

H<sub>02</sub>: There is no significant difference between undergraduates' access to learning content and reaction towards technology-enhanced platforms in private universities in Nigeria.

Table 5: Chi-Square Output on Significant Difference between Access to Learning Content and Reaction towards Technology-Enhanced Platform

	Value	df.	Asymp Sig, (2-Sided tail)	Significance Level
Pearson Chi-Square	324.292	200	.000	
Likelihood Ratio	220.162	200	.156	
Fisher's Exact Test	266.087			.000
Linear-by-Linear Association	29.233	1	.000	
No. of Valid Cases	180			

From Table 4, Pearson Chi-Square = 324.292, and  $p = .000$ . The null hypothesis is rejected, since  $p < 0.05$  ( $p = 0.000$ ). In conclusion therefore, there is strong evidence that access to learning content contributes to the reaction of undergraduate students toward technology-enhanced platform for learning. Hence, the null hypothesis is rejected.

## DISCUSSION

The application of Technology-Enhanced Learning (TEL) platform promotes virtual learning environment and as well motivates learners to concretize knowledge acquired through the medium. Learning through technologies; Technology-Enhanced Learning has become a global phenomenon and the Internet is often seen as a value-neutral tool that potentially allows individuals to overcome the constraints of traditional elitist spaces and gain unhindered access to learning contents (Gulati, 2008). The finding of this study on reaction clearly justified the submission of Gulati (2008) because the response is positive with respect to the use TEL to deliver instructional content in this COVID-19 era. In turbulent times, like in this current pandemic of COVID-19, success, and sometimes survival, depend upon the ability to distinguish between what is changing and what is staying the same (Goodyear & Retalis, 2010). Hence the COVID-19 might be staying longer than expected and there should be a means to continue the business of education; Technology-Enhanced Learning.

The term Technology-Enhanced Learning (TEL) is used to describe the application of information and communication technologies to teaching and learning (Kirkwood & Price, 2014). The statement is explicit in explaining the term TEL to mean a shared understanding that can constitute an enhancement of the student learning experience. Technology-Enhanced Learning (TEL) has become a common feature of Higher Education, though creates some form of misleading understanding of the concept. (Dunn & Kennedy, 2019). The result of this study clearly negates the conception of Dunn and Kennedy (2019) because students through the high rate of awareness and positive reaction towards TEL seem to have a clear understanding of the concept.

The opportunity provided to access learning content through TEL in this study was positively influenced by the reaction and awareness of the students. On the other hand, preparing professional quality teaching materials, assuring the quality of instruction among teachers, and the lack of anytime access to teaching materials are generally accepted as major weaknesses of traditional classroom instruction (Cakir, Delialioglu, Dennis & Duffy, 2009). This implies that TEL offers a better means of presenting quality content materials in form of audio and text to strengthen the positive reaction of students. Conclusively therefore, the integration of TEL to bridge the gap of space created by the COVID-19 pandemic has lessen the negative effect of the diseases on learning and teaching from both the perspective of the students and the lectures respectively.

## CONCLUSION AND RECOMMENDATIONS

The use of technology to enhance learning process has contributed to the attainment of educational goal and objectives. Based on the analysis of the result analyzed, it was revealed that technology-enhanced learning platforms are pervasive among undergraduate students and as such bridge the gap of halting teaching and learning activities irrespective of the circumstances. The awareness rate of undergraduate students toward technology-enhanced

learning platform is high. It implies that majority of all students in private universities in Nigeria are well aware of technology-enhanced learning platform. Furthermore, access to instructional content through technology-enhanced learning platform is easily accessed by undergraduate students and as such motivates them to learn in achieving the goal of education. The learning environment is well conducive enough to develop a positive reaction to the technology-enhanced learning platform. Conclusively, therefore, the following are recommended based on the findings of this study:

1. Universities should step up campaign towards the use of technology-enhanced learning platform to propagate the awareness rate
2. University lecturers should engage the medium technology-enhanced platforms to disseminate instructional content to promote the level of access.
3. Lecturers should consolidate on the positive reaction of undergraduate students toward technology-enhanced platform thereby making the TEL environment conducive.
4. Seminar should also be organized to increase the awareness rate among undergraduate students so as to improve on positive reaction towards TEL platforms.
5. Lecturers should also inculcate the habit of colonizing TEL platforms space to build on the positive reaction of undergraduate students.

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