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Information technology and university administration: A comparative analysis of ICT implementation in tertiary institutions in Bayelsa state

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Abstract
Information technology and university administration were the subjects of this research, which was titled A Comparative Analysis of ICT Implementation in Tertiary Institutions in Bayelsa State. The study was directed by three research questions and three hypotheses. The participants in this research were 240 teachers and students drawn from Bayesa State Federal University, Otuoke, University of Africa, and Niger Delta University. Using the Taro Yamen formula, the sample size r was determined. To ensure that each member had an equal chance of being chosen, the basic random selection approach and purposive sampling were used. Questionnaires were the study's primary tool. The test-retest approach was used to determine the instrument's dependability. It evaluates the extent of ICT use in the chosen schools. The research found the following. According to our discussion on whether ICT facilities are available in tertiary institutions in Bayelsa state, a total of 248 respondents - 112 (45%) of whom strongly agreed-agreed, 55 (22%) disagreed, 68 (27%) disagreed strongly, and 13 (6%) disagreed with the hypothesis' assertion.Out of 248 respondents, a total of 97 (39%) strongly agreed, 58 (23%) agreed, 64 (26%) disagreed, and 29 (12%) disagreed with our findings on whether students and administrators readily accept ICT facilities for learning in tertiary institutions in Bayelsa state. From the aforementioned data, the vast majority of the stakeholders agree with the claim that Bayelsa state's students and administrators easily adopt ICT facilities for learning.In the end, our survey on whether management frequently uses ICT resources for administrative purposes in higher education institutions in the state of Bayelsa revealed that out of 248 respondents, a total of 87 (35%) strongly agreed, 79 (32%) agreed, 48 (19%) strongly disagreed, and 34 (14%) disagreed with the assertion in the hypothesis. The investigation leads to the conclusion that Bayelsa State's tertiary institutions employ ICT resources for administrative functions.

Keywords: ICT, university, administration, students, and lecturers are some of the key phrases

Introduction
The importance of information communication technology (ICT) tools in education has been highlighted by advances in science and technology. One of the most significant and quickly expanding advances in education today is the use of computers in classrooms. Private university owners entice students with the quantity of computers they can afford. Parents often evaluate a school's quality based on the amount of computers accessible and their connection (Usman, 2006) [56]. One needs computer literacy in order to use any ICT tool effectively. Actually, it is necessary for everyone with a letter to be computer literate. Every citizen has a right to be able to read and write. Similar to reading, a computer sends out signals that the student (the reader) must decipher, and similar to writing, the learner (the writer) creates messages that may tell the computer what to do. The two core components of computer literacy are these (Ovbiagele, 2004) [15].
The wellbeing of a person and their ability to read and write rely on these essential abilities. One's ability to operate a computer will primarily define one's worth in the workforce in this era of information explosion. Like regular or conventional literacy did in the past, computer literacy is anticipated to have an influence on professional choices in the future. In the future, computer literacy will be just as important as verbal and mathematics literacy were in the past. Therefore, it is crucial that students from Bayelsa state schools do not unintentionally lose access to the global labor market as a result of subpar instruction (Agumuo, 2005) [5].
To prepare the young for national growth, there is a need for an effective computer education program.

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The internet has the greatest potential for long-distance learning and ensuring that everyone has access to high-quality education, according to former United Nations secretary general Kofi Annan. It gives emerging nations the finest opportunity yet to occupy their proper position in the global economy. In light of this, we must thank the summit's organizers for scheduling this crucial zonal gathering of stakeholders.

Statement of the Problem
ICT has a highly obvious impact on education and educational activities across the globe, particularly when ICT facilities are used to implement the desired change in teaching and learning. Teachers are under pressure to use technology and ICTs to alter their classrooms as a result of the development. The use of ICT for educational activities like teaching and learning is heavily influenced by the availability of ICT facilities and their use. On the other hand, higher education institutions have a significant problem with regard to the accessibility and use of ICTs. A 2011 Hamilton-Ekeke study. Goals would be accomplished quickly if academic institutions fully adopted the use of ICTs in higher institutions of learning (Usman, 2006) [56]. The use of ICT for an educational revolution throughout tertiary institutions in Bayelsa State is the subject of this research.

Objective of the Study
The study's overarching goal is to examine how information technology is used to run tertiary institutions in Bayelsa State. Following precise goals were developed to direct this research from the objectives:
1. To assess the presence of ICT in Bayelsa state's higher institutions.
2. To determine if ICT facilities are regularly utilized for administration and learning in Bayelsa state's tertiary institutions.

To provide answers to the difficulties encountered while using ICT at tertiary institutions

Research Questions
The factors in this research that are being looked at include the accessibility, acceptance, and use of ICT facilities at tertiary institutions in Bayelsa state. For this study, the following three research questions are put forth:
1. Do tertiary institutions have ICT facilities?
2. Do pupils adopt ICT tools for learning readily?
3. Does management often use ICT resources for administrative needs?
4. How often are ICTs utilized in academic settings?

Research Hypothesis
The following null (Ho) and alternate (Ha) hypotheses were coined from the research questions:
- **Ho 1:** ICT facilities are not readily available in tertiary institutions in Bayelsa state.
- **Ha 1:** ICT facilities are readily available in tertiary institutions in Bayelsa state.
- **Ho 2:** Management of tertiary institutions do not often use ICT facilities for Administrative purpose.
- **Ha 2:** Management of tertiary institutions often use ICT facilities for administrative purpose.

Scope of the Study
The study's scope is limited to tertiary institutions in Bayelsa State and its primary focus is a comparative analysis of ICT adoption in those institutions.

Theoretical Review
Because the focus of this research is the use of information and communication technology (ICT) in tertiary institutions in Bayelsa State, behaviorism theory is used to describe and demonstrate how employees in the institutions behave toward ICT.

Behaviorism
The behavioral theory, often known as behaviorism, was developed by J.B. Waston and B.F. Skinner and focuses on how pupils learn. All behaviors are said to be learnt by contact with the environment, according to the behavioral perspective. Waston and Skinner felt that, if they were given a bunch of newborns, their upbringing and environment would ultimately determine how they behaved, rather than their parents or genetic makeup.

Elkaseh, *et al*. (2015) [20] used the technology acceptance model to conduct a research on the adoption of e-learning aids for teaching and learning. The attitude and perceived ease of use of the study's variables are considered to be the key predictors and determinants of the instructors' intentions to utilize e-learning technologies for teaching and learning. Similar research was conducted by Abdul Jalil and Zainuddin (2015) into the integration of accounting information systems, and they discovered that perceived usability directly influences human attitudes and is substantially correlated with behavioral intentions.
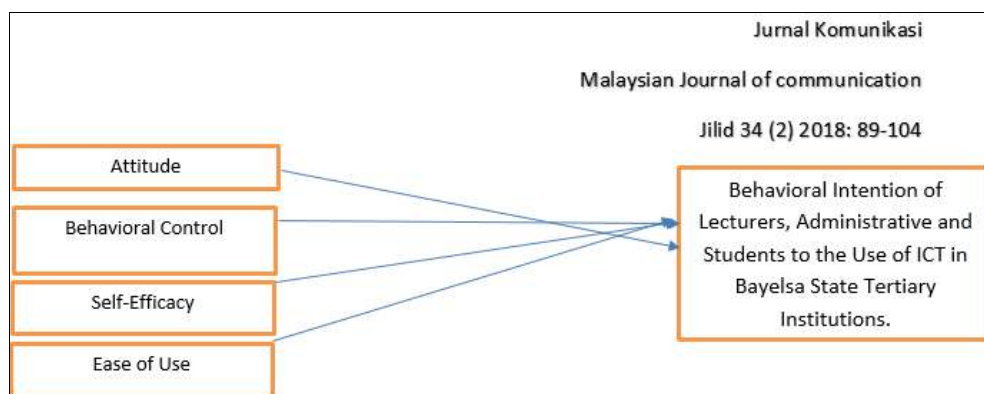

Fig 1: Proposed research framework

According to Figure 1, there is a correlation between the behavioral intention of lecturers, administrators, and students to use ICT in Bayelsa State Tertiary Institutions and attitude behavioral control, self-efficacy, and ease of use.

Attitude

According to a 2013 research by Aboelgamed and Gebba, individual attitude directly and significantly affects behavioral intention to use a certain technology. Mulwa and Kyalo (2013) [33] assert that the attitude of the implements has a significant role in how well ICT is implemented in administration, teaching, and learning. The main barrier to the effective execution of an e-learning project was therefore determined to be a negative attitude against the use of ICT (Othman, Pislaru, Kenan & Impes, 2013) [45]. Additionally, it's important to research and determine how much user attitudes affect how ICT is used in administration, education, and learning.

The adoption and use of computers in the workplace and in the classroom to manage work is significantly influenced by the administrators' and lecturers' attitudes (Angondy, 2013). In a research by Sanchez, Marcos, and Guan Lin (2012), the lecturers' attitudes about the use of ICT in the classroom were examined. The results demonstrate that the lecturers' attitudes have a favorable impact on ICT.

Similar research was conducted by Ayub, Bakar, and Ismail (2015) [18] on the variables that influence teachers' attitudes about using ICT in teaching and learning. The authors discovered that attitude is the greatest predictor of the teacher's adoption of ICT and that attitude has a favorable impact on the teacher's decision to utilize ICT. Elkaseh, *et al*. (2015) [21] discovered a favorable and substantial link between attitude and behavioral intention to use. Therefore, in order to create a new method of management and lecture delivery to students, attitude would have a good impact on the behavioral intention of lecturers and administrative personnel to utilize ICT in Bayelsa state tertiary institutions.

Perceived Behavioral Control

The degree to which individuals believe they have control over endorsing their desired behavior is known as perceived behavioral control. Therefore, the person has the opportunity to participate in activities they believe they have control over as well as to refrain from behaviors they feel they have no control over (Aboelmaged & Gabba, 2013; Wan Mahmud & Pitchan, 2017) [1].

As a result, someone who feels they are capable of exhibiting a given behavior will act in a manner consistent with their behavioral intention to do so. According to Altawallbeh, Soon, Thiam, and Alshourah (2015) [10], the intention of an individual's behavioral intention to use or embrace technology may be determined and predicted by their perception of behavioral control. As a result, lecturers' acceptance of using ICT for teaching and learning is seen behavioral control. The perceived behavioral control is reported to be a good predictor of ICT adoption and use, according to the theory of planned behavior (TPB) (Aboelmaged & Gabba, 2013; Khasawneh & Ibrahim, 2012; Nchise, 2012) [1, 35]. As a result, a user will display a comparable behavioral intention to adopt and utilize the aforementioned technology if they feel they can use the application (Aboelmaged & Gabba, 2013) [1]. According to Salleh and Laxman (2013), one of the elements affecting

teachers' decisions to utilize ICT in the Beunean Secondary schools is their perception of behavioral control. Additionally, Nchise (2012) [35] discovered that perceived behavioral control significantly affects how ICT is used. Altawallbeh, Soon, Thiam, and Alshourah (2015) [10] looked at the instructor's behavioral intentions about technology. The outcome demonstrates that TPB and an instructor's behavioral intention to employ technology have a link. This demonstrates that behavioral control may be used to forecast and decide on the extent of the lecturer's ICT usage for teaching and learning in institutions.

Self-Efficacy

Self-efficacy has been studied in a variety of research areas, including the acceptance of technology learning, mobile commerce, health, e-learning, banking systems, and health (Sirois, 2015; Chan, Prendergast & Ng, 2016) [52, 53]. Self-efficacy has therefore been researched from several perspectives, but more research is required to determine how it affects lecturers' behavioral intentions with regard to the usage of ICT.

Whether tools or capacities are required to complete a job depends on one's level of self-efficacy. In addition, users' computer knowledge, experience, and skill have been recognised by the theoretical viewpoint on the adoption of ICT as having an influence on their perceived self-efficacy (Robertson & Al-Zahrani, 2012) [50]. Robertson and Al-Zahrani (2012) [50] discovered that users' personal views cross with their practical knowledge and associated abilities and that these interactions result in unconscious or habitual behaviors. According to Jungert and Rosander (2010) [28], personal habits demonstrate competence and have an impact on learners' self-efficacy. Thus, when teachers' self-efficacy increases, so do their beliefs and practices, as well as their levels of confidence and related competence while employing technology in teaching and learning institutions (Jungert & Rosander, 2010; Abulibdeh & Hassan, 2011) [28]. Therefore, research suggests that self-efficacy might affect a lecturer's behavioral intention to utilize ICT.

Ariff, Yeow, Zakuan, Jusoh, and Bahari (2012) [16] conducted a research that looked at the relationship between computer self-efficacy and technology adoption. The study used the technology acceptance model to explain its findings. The authors demonstrate that self-efficacy and the behavioral intention to utilize technology are positively correlated. Using the TAM (Technology Acceptance Model) model, Amornkitpinyo and Wannapiroon (2015) [11] investigated the acceptance of e-commerce among generation Y. The results showed that self-efficacy has a positive and significant influence on users' behavioral intentions towards the use of technology. This demonstrates how self-efficacy might impact ICT users' behavioral intentions in a favorable way.

Empirical Review

In a research on the use of ICT in private universities in Nigeria, Oyim (2004) [48] found that practically all of the private institutions employed ICT to manage administrative activities. The research found that ICT was used for student enrollment, student record keeping, accounting, general administration, and library upkeep. It was claimed that those who used ICT for administrative reasons said it was dependable, convenient, and efficient. On the other side, Oyedele (2015) [47] looked at the elements that influence

faculty members at tertiary institutions to use ICTs in their instruction. They are greatly influenced by factors including computer self-efficacy, relative benefit, compatibility, and past experience when determining how easy a technology is to use and how it will be received.

In a study on the use of ICT for facilitating teaching and learning in Nigerian universities, Obadaike (2006) found that a variety of internet-based applications can be used by students to complete tasks like course applications, course and examination registration, viewing exam results, accessing the timetable, and paying university fees. The usage of ICT by staff employees for services like leave requests, e-forms for different purposes, and personal financial information pertaining to the institution was also noted.

Research Design
This study employed a descriptive research approach, which is popular in the social and management sciences and involves observing and gathering data on a certain subject. According to Creswell (1994), the descriptive method of research is a technique used to obtain data on the current state of the situation. The goal of the descriptive approach, according to Creswell (2012, p. 274), is to methodically discover a thorough explanation and description about the subject of the investigation. Without taking into account any speculative or other assumptions, the descriptive design enables the researcher to examine and characterize the distribution of one or more variables.

Justification
Population of the study
The 1.7 million people who live in Bayelsa state are counted in the 2006 census. Out of this total, 800 000 of the people are men and 900 000 are women. The study's relevant population is restricted to all adult citizens, male and female, who are employed by tertiary institutions in the chosen Bayelsa state universities. The foundation of our investigation is this population. This group of people is the one who can express themselves clearly and provide the crucial data for a research of this kind. The Niger Delta University (NDU), The Federal University Otuoke (FUO), and The University of Africa (UAT), employing the administrative employees of all three institutions, make up the population of this research. NDU employs 3518 people in total, including academic and non-academic personnel, FUO has 950 employees (650 academic and 300 administrative), UAT has 361 employees as of September 1, 2021. 4829 people make up the study's whole sample.

Sample Size
Out of the total population, 240 people were accessible, including randomly chosen students, professors, and non-academic employees from the higher institutions in Nigeria's Bayelsa State. Respondents in three (3) tertiary institutions from the three (3) senatorial districts in Bayelsa state, including University of Africa, Toru-Orua (Bayelsa West senatorial district), Niger Delta University (NDU), and Federal University, Otuoke (Bayelsa East senatorial district), were given 240 questionnaires to complete. Each institution received eighty (80) surveys from the researcher, for a total of 240.

Sampling Technique
To ensure that each member had an equal chance of being chosen, the basic random selection approach and purposive

sampling were used. Simple random sampling is a method of selection that gives every component or individual in the population an equal chance to be picked, according to Mason and Bramble (1997:138). The benefit of this strategy is that it effectively eliminates bias-related aspects while guaranteeing that every member of the sampled population has a chance of being chosen. Additionally, the sample units are chosen from the three (3) universities in the state of Bayelsa's three senatorial districts.

Sources of data
Basically, there are two main types of sources used to gather data: primary sources and secondary sources. Self-collected data are considered primary sources, while textbooks, newspapers, reports, publications, and journal articles are considered secondary sources. Both primary and secondary sources of information will be used in this study's data collecting. A list of open-ended questions will be created for the main source. The results of the disseminated surveys will then be examined and assessed using a data analysis template.

Method of Data Collection
The questionnaire is the instrument used to gather data. The survey will be sent out to the responders. Simple percentages were used as the analytical tool in tabular form for the analysis of the data collected from the respondents. The research question posed in chapter one of the study will be converted into two (2) parts of the questionnaire. These are the different sections.

Method of Data Analysis
While quantitative research is deductive and employs numerical data such as symbols, tables, charts, and other mathematical tools to interpret data, qualitative research is descriptive/inductive and uses words. Cross-tabulations and other regular applications are performed on quantitative data using statistical tools in the social sciences. The demographic features of the population are described using descriptive statistics like percentages and graphical representations.

The information will be tabulated, and basic percentage calculations will be used to assess it.
It's computed as follows:

$$\text{Percentage (\%)} = \frac{\text{No. of Option} \times 100/1}{\text{Total}}$$

More specifically, a percentage was employed to determine the quantity of respondents and their answers to a certain question. The hypothesis is initially presented in the form of the null hypothesis (Ho), from which its alternative, hypothesis (H1), is derived.

Data presentation & analysis

Table 1: Occupation of Respondents

Occupation	Frequency	Percentage (%)
Students	82	34%
Non-academic Staff	56	15%
Opinion Leaders	42	17%
Lecturers	68	26%
Total	248	100%

***Source*:** Fieldwork 2023

According to Table 7, the category of students received the most responses (82 or 34%), followed closely by the category of lecturers (68 or 26%). 56 (23%) answers from the non-academic workforce followed, making opinion leaders the fourth group. The last group of 42 (17%) responders fell under the frequency threshold.

Table 2: Are ICT facilities available in tertiary institutions in Bayelsa state?

S. No	Questionaire Items	SA (%)	A (%)	SD (%)	D %	%
1.	ICT facilities are available in all tertiary institutions in Bayelsa state	112 (45%)	55 (22%)	68 (27%)	13 (6%)	100%
2.	ICT facilities are frequently used in learning and administration in tertiary institutions in Bayelsa state	82 (33%)	43 (17%)	76 (31%)	47 (19%)	100%

According to the aforementioned data, a total of 112 respondents (45%) strongly agreed, 55 respondents (22%) agreed, 68 respondents (27%) strongly disagreed, and 13 respondents (6%) disagreed. The second item explored the first research query 76 (31%) of respondents strongly disagreed, 76 (31%) of respondents agreed, 43 (17%) of respondents agreed, and 47 (19%) of respondents disagreed. 82 (33%) of respondents strongly agreed.

Table 3: Do Students and Administrators Readily Accept ICT facilities for learning in tertiary Institutions in Bayelsa State?

S. No.	Questionnaire Items	SA %	A %	SD %	D %	%
3.	Students and administrators do accept ICT facilities for learning in tertiary institutions in Bayelsa state	97 (39%)	58 (23%)	64 (26%)	29 (21%)	100%
4.	Due to lack of provision of data by management, ICT facilities has not been properly utilized in tertiary institutions in Bayelsa state.	125 (50%)	72 (29%)	37 (15%)	14 (6%)	100%
5.	Lack of accessible wi-fi in tertiary institutions contributes to low use of ICT facilities	132 (53%)	48 (19%)	39 (16%)	29 (12%)	100%
6.	The high rate of faulty computer systems equally contributes to low use of ICT facilities in tertiary institutions in Bayelsa state.	111 (45%)	42 (17%)	51 (21%)	43 (17%)	100%

According to the aforementioned table, a total of 97 respondents (or 39% of the total) strongly agreed, 58 respondents (or 23% of the total) agreed, 64 respondents (or 26% of the total) strongly disagreed, and 29 respondents (or 12% of the total) disagreed. A total of 125 (50%) respondents strongly agreed with the second item probing the research question, while 72 (29%) respondents strongly disagreed. A total of 132 (53%) respondents strongly agreed with the third item probing the research question, while 48 (19%) respondents agreed, 39 (16%) respondents strongly disagreed, and 29 (12) respondents disagreed. 111 (45%) of the respondents highly agreed, 42 (17%) of the respondents agreed, 51 (21%) of the respondents strongly disagreed, and 43 (17%) of the respondents disagreed with the fourth item that probed the study topic.

Table 4: Do management often use ICT facilities for administrative purpose?

S. No.	Questionnaire item	SA	A	SD	D	%
7	Management of tertiary institutions often use ICT facilities for administrative purpose in Bayelsa state.	87 (35%)	79 (32%)	48 (19%)	34 (14%)	100%
8	ICT facilities are used to collate results after examinations	92 (37%)	63 (25%)	54 (22%)	39 (16%)	100%
9	ICT facilities are used to write some courses in tertiary institutions in Bayelsa state	92 (37%)	77 (31%)	48 (19%)	31 (13%)	

According to the aforementioned table, a total of 87 respondents (or 35% of the total) strongly agreed, 79 respondents (or 32% of the total) agreed, 48 respondents (19% of the total) strongly disagreed, and 34 respondents (or 14% of the total) disagreed. 92 (37%) of the respondents highly agreed, 63 (25%) of the respondents agreed, 54 (22%) of the respondents strongly disagreed, and 39 (16%) of the respondents disagreed with the second item that probed the study topic. 92 (37%) of the dejected respondents strongly disagreed with the third item of the study question, 77 (31%) of the respondents agreed, 48 (19%) of the respondents severely disagreed, and 31 (13%) disagreed.

Discussions of Findings
The study of the data provided above led to the following conclusions being made.
According to our discussion on whether ICT facilities are available in tertiary institutions in Bayelsa state, a total of 248 respondents-112 (45%) of whom strongly agreed-agreed, 55 (22%) disagreed, 68 (27%) disagreed strongly, and 13 (6%) disagreed with the hypothesis' assertion.

Out of 248 respondents, a total of 97 (39%) strongly agreed, 58 (23%) agreed, 64 (26%) disagreed, and 29 (12%) disagreed with our findings on whether students and administrators readily accept ICT facilities for learning in tertiary institutions in Bayelsa state. From the aforementioned data, the vast majority of the stakeholders agree with the claim that Bayelsa state's students and administrators easily adopt ICT facilities for learning.
In the end, our survey on whether management frequently uses ICT resources for administrative purposes in higher education institutions in the state of Bayelsa revealed that out of 248 respondents, a total of 87 (35%) strongly agreed, 79 (32%) agreed, 48 (19%) strongly disagreed, and 34 (14%) disagreed with the assertion in the hypothesis. According to the previous study, the majority of the interested parties agree with the claim that management often uses ICT resources for administrative purposes in Bayelsa state's higher education institutions. Today's globe has essentially become a global village because to the development and use of information technology, which has made it easier for people to survive and advance quickly from one region of the world to another. It is clear that the

conventional information system used in workplaces has relied heavily on human tasks and processes. The development of information technology has had a significant impact on almost every part of human effort, including workplaces and the education sector. (2006) Ajileye. Eardly (1989) asserts that information technology-related activities and operations in offices will have the following effects 1. Contributing to the offices' ability to provide a wider range of services. Improved time, human resource, and financial efficiency across the whole data processing and transmission process from the data source to the consumers. 3. Better information quality, including more precise information that is also timeless. 4. More adaptability and responsiveness to specific user demands, allowing information systems to be more easily customized to meet those needs. Efficiency improvements brought about by sharing a single data base, either within the same ministry or by leveraging other base sources. 6. Increased user participation with respect to particular information and processing demands, as well as a review and modification of those needs as the issue scenario evolves or progresses.

Concluding Remarks
This research comes to the conclusion that in the era of internet services, it is difficult to provide a good quality education for young people in Bayelsa States' higher institutions if they are cut off from the outside world. Scholars are well aware of what they lose when they are cut off from the outside world. Once internet connectivity is established, the production of digital local content encourages the quick uptake of ICT, particularly if that local content directs users to complementary online resources, which occurs often.

Nigerian educational systems, from basic to postsecondary, have received enough education about the benefits of ICT in their teaching and learning. As soon as computers and a network are set up and pedagogical concerns are taken care of, they are prepared for e-learning. For the time being, several schools in the zone only have access to the stand-alone computers that are common in educational institutions. In the meanwhile, it should be encouraged for each lecturer to include as much of the available software into their daily lesson plans.

For instance, programs like Microsoft Word, Excel, CorelDraw, and PowerPoint should be included into the right teaching and learning activities. Every professor should make an effort to use email to interact with their students. Course materials and homework assignments should be distributed online using this method. The students will get the ability to engage and work collaboratively with classmates via this growth of the blended learning technique.

On the basis of the study's findings, the following suggestions were made
1. To improve the efficacy and efficiency of the university system, university management should encourage technological innovation and devote more resources to its development and use.
2. The administration of higher education should be flexible in order to incorporate new developments in technology.
3. Universities should improve and broaden their partnerships with businesses to guarantee funding for the provision of services and skills.
4. Universities should prioritize improving their efforts to develop new skills for more employment by routinely assessing their curricula to align with societal and industry expectations.

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