Impact of Modern Technology on Undergraduate Students for Teaching and Learning in Tertiary Institutions

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ABSTRACT

The education sector is becoming more and more reliant on modern technology, which has led to constant communication with students and the availability of many forums for learning support. The study adopted a correlational survey research designed to examine the impact of modern technology on undergraduate students for teaching and learning in tertiary institutions. Three research objectives, three research questions and three hypotheses guided the study. The population of the study is 122 year two students from the department of library and information science, Faculty of Education, Rivers State University and 128 year two students from the department of curriculum studies/instructional technology, Faculty of Education, Ignatius Ajuru University of Education. A sample of 100 students was used for the study. A structured questionnaire was used for the study with a 32 item. Face validity and a reliability coefficient of 0.82 was obtained. Mean and Z test were the statistical tools used for the study. According to the report, modern technology gives teachers and students immediate feedback and enables students to pick up practical life skills. It was suggested that teachers give students a list of places in their school district that offer free internet access (cafés, libraries, restaurants, etc.).

Highlights of this paper
- Modern technology uses collaboration, technology, and creativity, unlike traditional education.
- Technology provides a flexible and engaging way of gaining an education.
- The use of modern technologies in education for teaching and learning encourages students to study.

1. INTRODUCTION

Modern technology has been acknowledged by educators as a useful tool for facilitating lessons and improving the entire learning process. With technology present in the classroom, the learning process has changed from being passive and reactive to being active and engaged (Amarender, 2021). Although modern technology has advanced rapidly in recent years, it has also permeated every aspect of our daily lives, including education. Education has undergone a significant technological revolution, and this is significant. The education sector is becoming more and more reliant on modern technology, which has led to constant communication with students and the availability of many forums for learning support. There will undoubtedly be a rise in several new applications to assist kids in development and learning, as we have already seen during the global catastrophe of the coronavirus pandemic (School of Education Online Programme, 2022). Wikis and Google Docs are two examples of technological platforms that students can use to collaborate on group assignments. The boundaries of the classrooms are no longer an impediment because technology has made it possible to learn, connect, and collaborate in new ways. The roles of teachers and students are starting to change as a result of technology. As a result of technology, communication and cooperation opportunities have increased. In the past, classrooms have been somewhat solitary places where students could only collaborate with those in their immediate vicinity. Technology today makes communication and collaboration possible in ways that were previously unimaginable (Purdue University, 2022).

The benefits of modern technology are as follows:
- Improved interpersonal communication as a result of current communication tools like email, short message service, multimedia messaging service, video calls, etc.
- Because of the internet and video conferencing technology, it improves education; it has given highly skilled students jobs in a variety of industries; and it has made life more comfortable and simpler.
- Everyone has benefited from it in terms of getting complete Medicare, better transportation, and improved communication methods (Boyarsky, 2021).
- As faraway locations have become closer thanks to current communication tools, businesses have multiplied.
- Because modern technology is expanding and developing, there is room for everyone to develop in the future.

Kans (2022) asserts that practically every aspect of our life, including education, has been significantly impacted by the development of technology in recent years. Technology has had a significant impact on schooling. There are now a huge number of easily accessible instructional information sources available online, including audio files, photos, videos, and eBooks. Students today are more motivated to actively participate in class activities because of technology. Many students are reluctant to engage because they find speaking in front of their peers to be frightening. Many manual chores may now be completed easily and more effectively thanks to technology. Life has improved as a result of technology, we cannot downplay the value of technology in education (Fulton, 2019). It has been considerably simpler for teachers to transfer knowledge thanks to the introduction of computers and other technologies into the classroom, students now find learning to be lot simpler.

The following are some ways that technology enhances education:

- Digital simulations and models: Students sometimes struggle to understand concepts in traditional learning. Digital simulations and models can aid students in better understanding a variety of subjects as well as familiarizing themselves with the wonders of the modern world (Morison, 2018).

- Better communication: A vital component of every endeavor is communication; ineffective communication is also not acceptable when it comes to education. Since technology has developed, communication gaps in traditional and virtual classrooms have been minimized. With online collaboration tools, everyone can easily create a community where teachers offer projects to their students in real time and students may ask for clarifications, as needed, (Nick, 2017).

- Advanced research: Today's students may conduct research much more easily because of cloud storage. The days of having to go through mountains of books to find a specific reference to help them with their assignments and projects are long gone. Technology has made research a very powerful instrument (Jasper, 2022).

- Effective assessments: Teachers are able to carry out lessons in an effective manner with the use of digital simulations and models, and they are also able to track the progress of the pupils. Software is available that allows teachers to evaluate their students in real-time and receive feedback from them. These programs are designed to assist teachers in staying current with all records (The Scientific World, 2019).

- Learning at one's own pace: It goes without saying that students now have a lot of advantages because of the rise of technology in the educational sector. There is no need to merely skip it off when they choose to learn a certain idea and encounter any difficulties. Although some people are quick learners and can adjust rapidly, some people need a lot of time to fully understand a concept (Marriel, 2018).

The following contemporary technologies, according to Prajakta (2022) can be applied in the classroom:

- Learning management systems
- YouTube
- Google Classroom
- Smart videos
- Online textbooks
- Gamification
- Social media
- Cloud technology
- Mobile technology
- Virtual reality
- Digital readers and tables

The significant contributions that technology makes to education enhance learning through better communication and the facilitation of students' abilities and knowledge. Additionally, students can access course materials from anywhere they are because of e-learning technology solutions (Milton, 2019). Technology, according to Concordia University Texas Blog (2021) enables teachers to accommodate any learning style, whether pupils learn best through lectures, reading, examples, or videos.

Students can learn at their own speed by watching online videos, listening to audiobooks, playing interactive games, and more. Students and teachers can simply get the most recent knowledge because internet content is readily updated. According to Terry (2021) learning technologies are the equipment, programs, and methods used in classrooms to aid, support, and encourage learning.

According to Bajraktari (2020) classrooms changed from being teacher-centered to becoming student-centered in the technological era. This resulted from a desire to concentrate more on the kids. Through the myriad technology resources at their disposal, teachers work to engage students and foster a sense of independence while also attempting to make learning interesting, interactive, and educational for them.

1.1. Problem of the Study

Some postsecondary teachers see technology as a distraction in the actual classroom, even if they do not outright prohibit it, they may reluctantly consider technology to be more than just a necessary evil. However, perceptions are shifting following a year of distant learning during the COVID-19 epidemic. Instead of merely tolerating it, educators are discovering that technology and the power of digital tools, applications, and gadgets can boost student learning, stimulate collaboration, and raise engagement.

1.2. Goals and Objectives for the Research

The study's goal is to determine how contemporary technology has affected undergraduate students' teaching and learning in tertiary institutions. In particular, the study wants to:

1. Analyze how current technology affects undergraduate students' instruction and learning in higher education.
2. Identify the advantages of contemporary technology for undergraduate students in tertiary institutions for teaching and learning.
3. Examine the difficulties that undergraduate students encounter while using technology for both teaching and learning at tertiary institutions.

1.3. Research Issues

1. How does current technology affect undergraduate students in tertiary institutions in terms of teaching and learning?
2. What are the advantages of contemporary technology for undergraduate students in tertiary institutions for teaching and learning?
3. Do undergraduate students in tertiary institutions encounter difficulties while employing current technologies for teaching and learning?

1.4. Hypotheses

HO₁: The use of modern technology for teaching and learning by students at Rivers State University and the University of Port Harcourt does not differ significantly.

HO₂: There is no appreciable difference in the advantages of contemporary technology for teaching and learning between students at Rivers State University and those at the University of Port Harcourt.

HO₃: The difficulties in using current technologies for teaching and learning are similar for students at Rivers State University and University of Port Harcourt.

2. METHODOLOGY

In order to investigate the effects of contemporary technology on undergraduate students for teaching and learning in tertiary institutions, the study utilized a correlational survey research methodology. The study's population consists of 122 second-year students from the faculty of education's department of library and information

science, Rivers State University and 128 second-year students from the department of human kinetics and health education at the University of Port Harcourt in Rivers State, Nigeria. The study used a sample of 100 students. For the investigation, simple random sample methods were employed. For the study, a standardized questionnaire comprising 32 items was used. The dependability coefficient was 0.82. The study's statistical techniques included mean and Z test.

3. RESULTS

Research Question 1: What effect does contemporary technology have on undergraduate students' learning and instruction at tertiary institutions?

Table 1. Shows the effects of modern technology on college students.

No.	Items Effects of modern technologies on students at the undergraduate level	SA	A	D	SD	Mean X	Standard Deviation	Total No of Respondents
1.	Technology makes information accessible to pupils.	70	20	7	2	3.60	0.70	100
2.	Technology helps pupils learn more quickly.	82	18	–	–	3.82	0.38	100
3.	Students can explore new disciplines and get a deeper understanding of complex ideas thanks to modern technology, especially in the fields of science, technology, engineering, and mathematics.	80	20	–	–	3.80	0.40	100
4.	Students can acquire the technical skills needed for the 21st century both inside and outside the classroom through the use of technology.	60	40	–	–	3.60	0.48	100
5.	Students learn to collaborate by playing educational games and engaging in online lessons.	70	28	2	–	3.68	0.50	100
6.	Through group projects, students may communicate ideas and assist one another.	55	45	–	–	3.55	0.49	100
7.	One-on-one interactions with teachers are made possible by technology	64	36	–	–	3.64	0.48	100
8.	Students can ask questions about the classroom and get more clarification on concepts that they find challenging.	40	60	–	–	3.40	0.49	100
9.	24/7 access to educational information is made possible by modern technologies.	78	22	–	–	3.78	0.41	100
10	Students can upload their assignments at home, and teachers can use laptops to access and view finished work.	90	10	–	–	3.90	0.30	100
	Average Mean					3.67	0.64	

Table 1 demonstrates that students agreed with all of the statements made regarding how modern technology has affected undergraduate students' learning and teaching in postsecondary institutions. This is as a result of the fact that the means of all the items were more than the 2.50 criterion mean. An overall average of 3.67 demonstrates that teachers may access and view completed assignments using their laptops and that students can upload their homework from home.

Research Question 2: What are the advantages of contemporary technology for undergraduate students in terms of teaching and learning in tertiary institutions?

Table 2. The advantages of contemporary technology for college students.

No.	Items **Advantages of contemporary technology for college students**	SA	A	D	SD	Mean X	Standard Deviation	Total No of Respondents
1.	A more interesting learning environment is produced by modern technologies.	51	43	4	2	3.45	0.66	100
2.	Different learning methods were included by modern technology.	50	37	13		3.37	0.70	100
3.	Collaboration is improved by modern technology.	55	38	4	3	3.45	0.71	100
4.	It increases students' desire to learn.	60	35	3	2	3.53	0.66	100
5.	Self-paced learning is possible because to modern technology.	49	48	3	-	3.46	0.58	100
6.	Students are more interested and better able to retain material thanks to modern technology.	49	45	5	1	3.42	0.64	100
7.	Teachers and students can receive immediate feedback thanks to modern technologies.	61	38	1	-	3.60	0.56	100
8.	Students are prepared for the future through modern technology.	53	46	1	-	3.52	0.52	100
9.	Useful life skills can be taught to students using technology.	65	30	5	-	3.60	0.58	100
10	Students' memory recall is enhanced by modern technology.	53	45	2	-	3.51	0.54	100
	Average Mean					3.49	0.61	

Table 2 demonstrates that students agreed with every claim made regarding the advantages of contemporary technology for undergraduate students in terms of teaching and learning in higher education. This is as a result of the fact that the means of all the items were more than the 2.50 criterion mean. A 3.49 average score indicates that modern technology gives teachers and students immediate feedback and teaches students practical life skills.

Research Question 3: When employing current technology for teaching and learning in tertiary institutions, do undergraduate students encounter any difficulties?

Table 3 demonstrates that students acknowledged every question on the difficulties that modern technology poses for undergraduate students in terms of teaching and learning in higher education. This is due to the fact that every item's mean was higher than the 2.50 criteria mean. An overall mean of 3.56 implies that it is challenging to deal with online courses in the present era because of how often incorrect information is provided to students through technology.

4. HYPOTHESES

HO1: There is no discernible difference between students at Rivers State University and University of Port Harcourt. impact of modern technology on students' learning and teaching.

HO1: Table of analysis to compare the University of Port Harcourt and Rivers State University's impact on undergraduate students' use of contemporary technologies for teaching and learning.

Table 3. Difficulties students have when adopted contemporary technology.

No.	Items The difficulties kids encounter when employing modern technology	SA	A	D	SD	Mean X	Standard Deviation	Total No of Respondents
1.	The use of technology separates students from reality.	52	28	4	16	3.28	0.87	100
2.	converting students into ineffective learners	57	40	3	-	3.54	0.55	100
3.	Inadequate teaching techniques are produced by modern technologies.	77	23	-	-	3.77	0.42	100
4.	Students are misled by outdated technologies and false information.	82	16	1	1	3.79	0.49	100
5.	Students routinely neglect their assignments and misplace it because to contemporary technology.	66	19	10	5	3.46	0.86	100
6.	Technology of today is a waste of precious time.	41	46	13	-	3.74	0.82	100
7.	Modern technology encourages cyberbullying and provides space for cheating.	50	39	11	-	3.39	0.67	100
8.	For students, modern technology has eliminated good penmanship.	42	56	2	-	3.40	0.52	100
9.	eBooks have displaced books with modern technology.	58	23	14	5	3.35	0.89	100
10	Online courses are challenging to manage with today's technology.	92	4	2	2	3.92	0.53	100
	Average Mean					3.56	0.66	

Table 4. Z test table of analysis between University of Port Harcourt and Rivers State University impact of modern technology for teaching and learning.

Group	Mean	SD	N	Df	Standard Error	Z -Cal	Z-Crit	Decision
University of Port Harcourt	3.67	0.64	50	98	0.13	1.38	1.96	Accepted
Rivers State University	3.49	0.61	50					

Table 4 hypothesis showed that the calculated Z-score of 1.38 is lower than the crucial Z-value of 1.96. The hypothesis is often accepted when the estimated value is lower than the critical value. This suggests that there are no appreciable differences between students at Rivers State University and University of Port Harcourt in terms of how modern technology affects teaching and learning.

HO2: *The advantages of contemporary technology for teaching and learning are similar for students at Rivers State University and University of Port Harcourt.*

HO2: *Table of analysis to evaluate the significant difference between University of Port Harcourt and Rivers State University's undergraduate students' advantages of contemporary technology for teaching and learning.*

Table 5. Z test table of analysis between University of Port Harcourt and Rivers State University advantages of modern technology for teaching and learning.

Group	Mean	SD	N	Df	Standard Deviation	Z-Cal	Z-Crit	Decision
University of Port Harcourt	3.69	0.58	46	98	0.46	0.74	1.96	Accepted
Rivers State University	3.35	0.68	54					

Table 5 hypothesis indicated that the calculated Z-score of 0.74 is lower than the crucial Z-value of 1.96. The hypothesis is often accepted when the estimated value is lower than the critical value. This suggests that the

advantages of contemporary technology for teaching and learning are similar for students at Rivers State University and the University of Port Harcourt.

HO3: The difficulties in using current technologies for teaching and learning are similar for students at Rivers State University and University of Port Harcourt.

HO3: Table of analysis to compare the University of Port Harcourt and Rivers State University's undergraduate students' experiences with the problems of modern technology.

Table 6. Z test analysis of difference between University of Port Harcourt and Rivers State University problems of modern technology for teaching and learning.

Group	Mean	SD	N	Df	Standard Deviation	Z–Cal	Z–Crit	Decision
University of Port Harcourt	3.56	0.66	45	98	0.13	2.07	1.96	Rejected
Rivers State University	3.29	0.66	55					

The Table 6 output demonstrates that the calculated Z-score of 2.07 exceeds the crucial Z-value of 1.96. The hypothesis is often rejected when the calculated value exceeds the critical value. This suggests that the difficulties presented by modern technology for teaching and learning to students at Rivers State University and the University of Port Harcourt are very different.

5. DISCUSSIONS

Research Question 1: What effect does contemporary technology have on undergraduate students' learning and instruction at tertiary institutions?

According to the report, teachers may access and examine completed assignments using their laptops while students can upload their homework at home.

The findings of the study concur with those of Raja and Nagasubramani (2018) who discovered that the development of technology, including digital cameras, projectors, mind-training software, computers, PowerPoint presentations, and 3D visualization tools, has made teachers more effective at assisting students in understanding concepts.

The results of the study are in line with those of Kaite, Jamie, Mohammed, and Adiel (2021) who discovered that employing technology for peer-to-peer and student-to-parent collaboration and communication has a favorable impact on current technologies in education.

Research Question 2: What are the advantages of contemporary technology for undergraduate students in terms of teaching and learning in tertiary institutions?

The study concluded that kids may learn practical life skills using technology, and that current technology gives teachers and students immediate feedback.

The results of the study are in line with those of Lortie (2020) who discovered that technological advancements had satiated some of the needs and demands of the modern age in the areas of instruction and education, including individualized instruction, the use of multi-sensory and multimedia materials, and efficient and effective management of various educational institutions.

The results of the study are in line with those of Ghavifekr and Rosdy (2015) who discovered that Information communication technology integration is highly effective for both teachers and students. They also discovered that one of the key elements in the success of technology-based teaching and learning is equipment preparation with information communication technology tools and facilitate.

Research Question 3: When employing current technology for teaching and learning in tertiary institutions, do undergraduate students encounter any difficulties?

According to the survey, it is challenging to deal with online courses because of modern technology, which also leads pupils astray with false information.

The findings of the study concur with those of Ahmad and Ahmad (2020) who discovered that technology is not viewed as a new problem that would impede or interfere with students' ability to learn in the classroom.

The findings of the study concur with those of Tazrin (2015) who discovered that using technology in the English language classroom is more difficult to implement from the teacher's perspective because they may not always have the essential materials available. Due to time constraints, a lack of understanding of how to utilize or incorporate technology into their lessons, tight guidelines set out by the school administration, and electrical issues, the majority of instructors are not interested in employing technology in the classroom.

The study supports the findings of Ogbomo (2011) who concluded that the use of Information communication technology in education has given rise to a number of legal and ethical difficulties as well as challenges, as well as poor quality of internet and telecommunication services.

6. CONCLUSIONS

The researchers came at the following conclusions:

1. Using their laptops, teachers can access and see completed assignments that students have uploaded from home.
2. Teachers and students may receive immediate feedback from modern technology, and students can use it to gain practical life skills.
3. Online courses are challenging to manage in the age of current technology, which also leads students astray with false information.

7. RECOMMENDATIONS

According to the findings, the researchers recommended the following:

1. Teachers should provide a list of WiFi hotspots or places with free internet access near their school (cafés, libraries, restaurants, etc.).
2. Teachers should create lesson plans employing technology and differentiated learning.
3. Teachers should share materials with pupils who do not have access to the internet.

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