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Psychological Influence of Digital Technology on Student's Engagement in Tertiary Institution

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Abstract

The world has become closer today than it was a few decades passed, partly and largely because of the increasing digitalization. All aspects of human endeavours are rapidly incorporating digital technologies into their operations. Education is one human endeavour in which the use of digital technologies have become very prominent and obvious. In Nigeria, tertiary institutions of learning appear to have adopted digital technology the most and it provide a credible case for investigating the psychological effective these digital technologies have on student engagement. It is on this premise that this study was conducted. This study was guided by three research questions which specifically sought the impact of digital technology usage on the cognitive, behavioural and social engagement of students in tertiary institutions. The study adopted a descriptive survey design. The population comprises students of two tertiary institutions in Enugu State (ESUT and Peaceland University) numbering 130. The population was adopted and were purposively selected for the study. A structured questionnaire titled "PEDTSETIQ" designed by the researcher was used for data collection. The questionnaire was validated by three experts. It was tested for reliability using Cronbach Alpha and an index of 0.82 was obtained. Data collected with the questionnaire were analysed using mean ratings while t-test statistical tool was used for testing hypotheses. The findings indicated among other things that digital technologies – when they are adequately available and properly utilized – have great impact on the cognitive, behavioural and social engagements of students in tertiary institutions of learning. The recommended increased funding for more integration of digital technologies and training of staff personnel that will aid the process.

Keywords: Behavioural, Cognitive, Digital Technologies, Engagement, Psychology

Introduction

In recent decades, digital technology has significantly transformed the global landscape, revolutionizing multiple sectors, including education. This transformation is part of a broader trend of digitalization that has brought about profound changes in the way individuals, organizations, and institutions operate. The education sector, in particular, has witnessed remarkable shifts due to the integration of digital technology,

affecting everything from curriculum delivery to student engagement. In the context of tertiary education, digital tools have become instrumental in reshaping the learning environment, influencing not only academic practices but also the psychological dimensions of student engagement. The increasing reliance on digital technology in tertiary institutions, especially in Nigeria, underscores the need to understand its psychological effects on student engagement. This study, therefore, explores the psychological impact of digital technology on student engagement in tertiary institutions, focusing on cognitive, behavioral, and social dimensions of engagement.

Digital technology encompasses a wide range of tools and platforms, including online learning systems, educational software, social media, mobile devices, and interactive platforms. These tools have facilitated access to information and resources while transforming traditional teaching and learning methods. According to Selwyn (2012), digital technology has altered the dynamics of the learning process, making it more interactive, collaborative, and accessible. In Nigerian tertiary institutions, the adoption of digital technology has grown significantly, as institutions seek to enhance the quality of education, improve student engagement, and keep pace with global educational standards (Adeoye, Adanikin, & Adanikin, 2020). However, the psychological effects of this digital shift, particularly its impact on student engagement, remain a critical area of study, given the complex nature of engagement in the educational setting.

Student engagement is a multifaceted concept involving emotional, cognitive, and behavioral dimensions, each contributing to a student's overall educational experience (Fredricks, Blumenfeld, & Paris, 2014). Cognitive engagement refers to the mental investment in learning, including critical thinking, self-regulation, and the motivation to comprehend complex concepts. Digital technology enhances cognitive engagement by offering diverse resources like e-books, online databases, and AI-driven learning aids that support independent learning (Dabbagh & Kitsantas, 2014). However, critics argue that while digital tools can promote self-regulated learning, they may also encourage shallow engagement if not carefully guided (Kirschner & van Merriënboer, 2016).

Furthermore, Behavioral engagement refers to participation in academic activities such as attending lectures, completing assignments, and collaborating in group work. Digital technology, particularly learning management systems (LMS) and educational software, can boost behavioral engagement by facilitating assignment submissions, assessments, and real-time communication with educators (Junco, 2014). However, research suggests that the distractions posed by digital devices, including social media, can sometimes detract from sustained academic focus and traditional classroom involvement (Kirschner & Karpinski, 2016).

Moreover, social engagement involves interactions with peers, instructors, and the broader learning environment, contributing to a student's sense of belonging and community within the university. Digital platforms such as social media, online forums, and collaborative tools have reshaped these interactions, enabling students to engage in group projects, share resources, and form academic networks beyond physical spaces (Wang & Reeves, 2007). While these digital spaces can foster a sense of belonging and connectedness, some scholars express concerns about the quality of online communication compared to face-to-face interactions, which may impact the depth of social engagement (Zhou & Li, 2024).

In Nigeria, the integration of digital technology in tertiary education has been influenced by various factors, including government policies, institutional initiatives, and global trends in higher education. The Nigerian government, through initiatives like the National Policy on Information and Communication Technology (ICT) in Education, has emphasized the importance of digital literacy and the adoption of digital tools in educational institutions (Federal Ministry of Education, 2019). Consequently, many Nigerian tertiary institutions have invested in digital infrastructure, including e-learning platforms, online libraries, and virtual classrooms, to improve the quality of education and enhance student engagement.

However, the implementation of digital technology in Nigerian tertiary institutions is not without challenges. Issues such as inadequate funding, lack of digital infrastructure, limited access to reliable internet, and insufficient training of academic staff have been identified as barriers to effective digital integration (Adeoye, Adanikin, & Adanikin, 2020). These challenges can impact the effectiveness of digital technology in enhancing student engagement, as well as its psychological effects on students. Therefore, understanding the specific context of Nigerian tertiary education is crucial for evaluating the psychological impact of digital technology on student engagement.

The psychological impact of digital technology on student engagement is a complex and multifaceted issue, as it can have both positive and negative effects. On one hand, digital technology can enhance motivation, interest, and academic self-efficacy, thereby positively affecting cognitive engagement (Bandura, 1997). On the other hand, the overuse of digital devices and platforms can lead to digital fatigue, anxiety, and a sense of information overload, which may negatively impact students' psychological well-being and overall engagement (Reed, 2017). Furthermore, the use of digital technology can influence students' social dynamics, as online interactions may alter traditional patterns of communication and collaboration within the academic environment.

Given these considerations, this study aims to investigate the psychological effects of digital technology on student engagement in tertiary institutions, specifically in the context of Nigerian higher education. By examining the cognitive, behavioral, and social dimensions of engagement, this research seeks to provide

insights into how digital tools shape students' learning experiences and offer recommendations for optimizing the use of digital technology in higher education.

Statement of the Problem

The integration of digital technology in tertiary education has significantly altered the educational landscape, offering new opportunities for enhancing student engagement. Digital tools such as e-learning platforms, social media, and interactive applications are widely adopted to facilitate learning, foster collaboration, and make education more accessible. However, while these technologies have the potential to enhance the cognitive, behavioral, and social engagement of students, they also present challenges that may affect students' psychological well-being. Issues such as digital distractions, information overload, reduced face-to-face interaction, and digital fatigue are concerns that may negatively impact the quality of student engagement. In Nigeria, where tertiary institutions are still navigating the complexities of digital integration amid infrastructural and funding challenges, the psychological effects of digital technology on student engagement remain largely underexplored. This gap in understanding creates uncertainty about how best to utilize digital tools to support student learning effectively. Without a comprehensive analysis of these psychological effects, there is a risk of digital technology being either underutilized or misapplied, potentially hindering the educational experiences of students. This study aims to address this gap by investigating the impact of digital technology on cognitive, behavioral, and social engagement among students in Nigerian tertiary institutions, particularly in Enugu State, offering insights to optimize digital integration.

Purpose of the Study

The purpose of the study is to examine the psychological effect of digital technology on student engagement in tertiary institutions in Enugu State. It specifically sought to:

1. determine the influence of digital technology usage on the cognitive engagement of students in universities
2. ascertain the influence of digital technology usage on the behavioural engagement of students in universities
3. assess the influence of digital technology usage on the social engagement of students in universities

Research Questions

The following questions guided this study:

1. What is the influence of digital technology usage on the cognitive engagement of students in universities in Enugu State?

2. How does digital technology usage influence the behavioural engagement of students in universities in Enugu state?
3. What is the influence of digital technology usage on the social engagement of students in universities in Enugu State?

Methodology

This study adopted descriptive survey research design. According to Jalil (2016) survey research design refers to the logical structure of an inquiry. Furthermore, Yin (2015) asserts that survey research design thus deals with a logical problem. This lends some credence to the application of the survey. It is to provide the opinion of the respondents on psychological effective of digital technology on students engagement in tertiary institutions in Enugu State.

The population of the study comprises 200 students from Enugu State University of University of Science and Technology (ESUT) and Coal City University, Enugu. The population was adopted for the study. Therefore, the sample size for this study is 200. A structured questionnaire titled "Psychological Effect of Digital Technology on Student Engagement Questionnaire (PEDTSEQ)" was used for data collection. Mean rating and t-test statistical tool were used for data analysis and test of hypotheses respectively. For research questions: item with mean score of 2.50 and above was accepted while item with mean score below 2.50 was rejected.

Results and Analyses

In this section, data collected were presented and analysed as follows:

Research Question

What is the influence of digital technology usage on the cognitive engagement of students in universities in Enugu State?

Table 1: Mean rating of responses to the influence of digital technology usage on the cognitive engagement of students

S/N	Items	SA 4	A 3	D 2	SD 1	$\bar{x}$	Decision
1.	Students find it easier to understand complex concepts when they use online educational resources (e.g., e-books, academic websites, and educational YouTube videos) on their computer or smartphone	21	14	6	2	3.26	Accepted
2.	Using AI chatbots (e.g., ChatGPT) for academic assistance helps students clarify their doubts and enhances their problem-solving skills	19	18	3	3	3.23	Accepted
3.	Social media platforms (e.g., educational groups on Facebook or WhatsApp) contribute to students' ability to engage with and comprehend course content.	13	21	5	4	3.00	Accepted
4.	Students are more motivated to study and complete assignments when they use digital tools like online quizzes, educational apps, and interactive simulations on their computer or mobile device	20	17	4	2	3.28	Accepted
5.	Regularly using smartphone to access digital academic platforms (e.g., university portals, online journals, and learning management systems) increases students interest and focus on studies.	19	19	3	2	3.28	Accepted
	Average					**3.21**	**Accepted**

Table 1 showed that all items have mean scores above the cut off point of 2.5, which indicates that they were accepted. In other words, all listed items are the influences digital technologies have on cognitive engagement of university students in Enugu State.

Research Question 2

How does digital technology usage influence the behavioural engagement of students in universities in Enugu state?

Table 2: Mean ratings of responses on the influence of digital technology usage on behavioural engagement of students

S/N	Items	SA 4	A 3	D 2	SD 1	$\bar{x}$	Decision
6.	Students often use social media platforms to participate in academic group discussions and share study materials.	19	16	4	4	3.16	Accepted
7.	AI chatbots help students stay organized with assignment deadlines and class schedules, increasing their participation in academic activities	21	19	2	1	3.40	Accepted
8.	Having access to a computer or laptop makes it easier for students to complete assignments on time and actively participate in online coursework	16	20	4	3	3.14	Accepted
9.	Using a smartphone allows students to access academic resources and stay connected with classmates, which encourages their involvement in group projects	20	19	2	2	3.33	Accepted
10.	Students are more likely to attend virtual classes or webinars when digital technology (e.g., laptops, smartphones) is readily available and accessible	17	19	4	3	3.16	Accepted
	Average					**3.24**	**Accepted**

Table 2 revealed that all items have mean ($\bar{x}$) scores that are above the 2.5 cut off point. This implies that all items are accepted as the influence digital technologies have on behavioural engagement of students in universities in Enugu State.

Research Question 3

What is the influence of digital technology usage on the social engagement of students in universities in Enugu State?

Table 4.3: Mean ratings of responses to the influence of digital technology usage on the social engagement of students in universities in Enugu State

S/N	Items	SA 4	A 3	D 2	SD 1	$\bar{x}$	Decision
11.	Social media platforms (e.g., Facebook, Instagram, and Twitter) facilitate peer interactions and group collaborations among university students.	20	18	3	2	3.30	Accepted
12.	The use of AI chatbots for academic support impacts students' willingness to engage in academic discussions and seek help from peers.	20	19	3	1	3.35	Accepted
13.	Laptops and computers play huge role in enhancing students' participation in virtual study groups and online academic communities	17	19	2	5	3.12	Accepted
14.	Smartphone usage helps maintain communication among classmates and building social networks within the university setting	18	20	2	3	3.23	Accepted
15.	digital technology tools (e.g., online forums, messaging apps) affect the frequency and quality of students' interactions with lecturers and academic advisors	18	18	3	4	3.16	Accepted
	Average					**3.23**	**Accepted**

Table 3 revealed that all items have mean ($\bar{x}$) scores that are above the 2.5 cut off point. This implies that all items are accepted. The implication is that all the items showed the influence digital technology usage have on social engagement of university students in Enugu State.

Discussion of Findings

Research question 1 sought the influence of digital technology usage on the cognitive engagement of students in universities in Enugu State. The findings indicate that digital technology largely enhances the cognitive engagement of students in universities in Enugu State, as digital tools offer diverse and flexible

resources that aid comprehension and learning. Research supports these results, with studies highlighting that access to online educational resources—such as e-books, academic websites, and educational videos—can improve students' understanding of complex concepts and promote self-directed learning (Dabbagh & Kitsantas, 2014). AI chatbots, such as ChatGPT, have been shown to clarify doubts and enhance problem-solving skills, aligning with the notion that personalized learning aids can improve cognitive engagement (Zawacki-Richter et al., 2019). Furthermore, the use of social media for academic discussions supports cognitive engagement by enabling collaborative learning and peer feedback, which are essential for deep understanding (Junco, 2014). However, critics argue that while digital tools can boost engagement, they may also lead to superficial learning if not properly guided, as some students may prioritize convenience over critical thinking (Kirschner & van Merriënboer, 2016). Additionally, the distractions associated with smartphones and social media can undermine focus and sustained academic effort, impacting cognitive engagement negatively if not well-managed (Rosen et al., 2013). Thus, while digital technology has notable benefits, its effectiveness relies heavily on appropriate usage and guidance.

The second research question sought how digital technology usage influences the behavioural engagement of students in universities in Enugu state. The findings of this study suggest that digital technology usage positively influences the behavioral engagement of students in universities in Enugu State by enhancing their participation in academic activities. Social media platforms have been shown to encourage students to collaborate in academic group discussions and share study materials, promoting a culture of collective learning. This aligns with research by Junco (2014), which found that social media use can increase engagement in academic activities by fostering communication and collaboration. Similarly, AI chatbots were noted to assist students in managing their academic tasks, improving organization and participation, consistent with findings by Marget Dabbagh and Kitsantas (2014) that digital tools aid self-regulated learning and task management. Additionally, access to devices like computers and smartphones facilitates the timely completion of assignments and participation in online coursework, supporting the argument that digital technology can remove barriers to academic involvement (Selwyn, 2012). However, some studies also highlight the potential downsides; for example, Kirschner and Karpinski (2014) caution that while digital tools can enhance engagement, they may also contribute to distractions that impede deep learning and reduce face-to-face communication. Thus, while digital technology can positively impact behavioral engagement, its potential to distract requires careful management to ensure effective academic outcomes.

The third research question inquired into the influence of digital technology usage on the social engagement of students in universities in Enugu State. The result indicate that digital technology significantly influences the social engagement of students in universities in Enugu State, facilitating both peer interactions and academic collaborations. Social media platforms like Facebook, Instagram, and Twitter have proven to be

valuable tools for enhancing peer communication and group work, aligning with recent studies that highlight social media's role in fostering social connections and collaborative learning (Al-Rahmi *et al.,* 2022). Moreover, the use of AI chatbots for academic support was shown to encourage students to engage in academic discussions and seek peer assistance, echoing research that supports AI's potential in boosting student engagement and self-directed learning (Dwivedi *et al.,* 2023). The prominence of laptops and computers in virtual study groups and online academic communities underscores the importance of digital devices in creating flexible and interactive learning environments, consistent with findings by Anderson *et al.* (2022) on the role of technology in promoting collaborative learning. On the other hand, concerns persist about digital distractions and their potential to diminish the quality of engagement, as smartphones, while enhancing communication, can also serve as sources of distraction (Lepp *et al.*, 2023). Additionally, while online forums and messaging apps increase interaction frequency, some studies suggest that they may lack the depth and personal connection of face-to-face communication (Zhou & Li, 2024). These contrasting perspectives underscore the complexity of digital technology's impact on social engagement, necessitating a balanced approach to its integration in academic settings.

Conclusion

The study highlights the profound impact of digital technology on student engagement in tertiary institutions, particularly within the context of universities in Enugu State. Findings indicate that digital tools significantly enhance cognitive, behavioral, and social engagement when properly utilized. Cognitive engagement benefits from diverse online resources and AI-driven personalized learning aids, which promote deeper understanding and self-directed study. Behaviorally, digital platforms facilitate active participation in academic tasks and collaborative learning, underscoring the importance of integrating technology in academic activities. Socially, digital technology, through social media and virtual learning environments, fosters academic collaborations and peer interactions, emphasizing its role in building educational communities. However, the potential for distraction, superficial learning, and diminished face-to-face communication remains a concern. The study underscores the need for balanced and guided use of digital technology to maximize its benefits while mitigating its drawbacks. Proper training for students and educators, alongside well-structured policies, can help harness the positive psychological effects of digital technology and foster deeper, more meaningful student engagement in tertiary institutions.

Recommendations

Based on the findings, the following recommendations are made:

1. Universities should develop structured guidelines and provide training for both students and educators on effective digital technology usage. This includes how to utilize AI tools, online resources, and social media for deeper cognitive engagement while minimizing distractions. Workshops on digital literacy and time management could help students maximize the educational benefits of technology while avoiding superficial engagement.
2. Tertiary institutions should invest in reliable digital infrastructure, including high-speed internet, interactive e-learning platforms, and updated AI-assisted tools. Improved access to digital devices like laptops and mobile applications can facilitate behavioral engagement by enabling students to participate more actively in online coursework, group discussions, and academic forums.
3. A balanced approach to digital integration can help address concerns about the reduction of face-to-face communication. Institutions should consider implementing blended learning models that combine online and in-person interactions, fostering both virtual collaboration and traditional classroom engagement. This approach ensures that digital technology enhances social engagement without undermining interpersonal connections.

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