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GENDER-BASED DETERMINANTS OF ICT USAGE AMONG TERTIARY STUDENTS: A TECHNOLOGY ACCEPTANCE MODEL (TAM) BASED STUDY IN NIGERIA.

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Abstract

This study aims to empirically examine the factors influencing the use of ICT by gender among students of the Federal College of Animal Health and Production Technology (VOM), Plateau State, Nigeria. The Technology Acceptance Model (TAM) was employed, with one additional variable to form the conceptual framework, and gender was used as a moderating variable. A stratified sampling technique was used to collect data from a total of 219 valid respondents, all of whom were students. Regression analysis results revealed that perceived ease of use (PEOU), perceived usefulness (PU), and availability of ICT infrastructure (AICT) had significant and positive correlations with the use of ICT services (UIT). Independent t-test results showed that PEOU had a greater influence on males, while AICT had a greater influence on females. The managerial and practical implications of these findings are discussed, along with suggestions for further research.

Keywords: ICT usage, Gender differences, Technology Acceptance Model, Perceived ease of use, Availability of ICT Infrastructure

1. Introduction

The advancement of Information and Communication Technology (ICT) has become a cornerstone of modern education, enabling students and educators to access vast resources and collaborate more efficiently. Despite the global spread of ICT

in education, usage patterns often differ significantly between genders, particularly in developing countries like Nigeria (Volman and van Eck, 2001). As educational institutions aim to enhance learning outcomes through technology, it is imperative to understand how gender influences ICT adoption and use.

This study examines the gender-based factors affecting students' use of ICT at the Federal College of Animal Health and Production Technology (VOM), Plateau State, Nigeria. The study extends the Technology Acceptance Model (TAM) by incorporating availability of ICT infrastructure (AICT) and exploring gender as a moderating variable.

2. Literature Review

2.1 Technology Acceptance Model (TAM)

Davis (1989) introduced TAM to explain user behavior regarding information technology. The model identifies two primary factors—perceived ease of use (PEOU) and perceived usefulness (PU)—as critical predictors of technology adoption.

2.2 Gender and ICT Usage

Research indicates that male and female students differ in ICT usage, confidence levels, and attitudes toward technology. While males often report higher confidence, females may experience greater apprehension due to socio-cultural influences (Cooper, 2006). However, gender gaps in technology use are narrowing with increased access and training.

2.3 Availability of ICT Infrastructure

Infrastructure availability is a major determinant of ICT usage, particularly in developing countries. Unreliable power supply, limited internet access, and inadequate facilities hinder effective ICT adoption (UNESCO, 2020).

3. Methodology

3.1 Research Design

A quantitative cross-sectional survey design was adopted.

3.2 Participants

The sample consisted of 219 students (113 males, 106 females), selected through stratified random sampling.

3.3 Instrumentation

A structured questionnaire was developed to measure:

- Perceived Ease of Use (PEOU)
- Perceived Usefulness (PU)
- Availability of ICT Infrastructure (AICT)
- Use of ICT Services (UIT)

A five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was employed.

3.4 Data Analysis

SPSS was used to analyze the data. Multiple regression analyses were conducted to examine relationships between variables, and independent samples t-tests were used to assess gender differences.

4. Results

4.1 Descriptive Statistics

Participants' ages ranged from 18 to 29 years. Most students had access to smartphones; fewer had personal computers.

4.2 Regression Analysis

The regression analysis aimed to determine the extent to which Perceived Ease of Use (PEOU), Perceived Usefulness (PU), and Availability of ICT Infrastructure (AICT) predict ICT usage (UIT) among students.

The findings show that all three predictors have significant and positive relationships with ICT usage, as reflected in the following standardized beta coefficients:

PEOU → UIT: $\beta = 0.317$, $p < 0.01$
PU → UIT: $\beta = 0.281$, $p < 0.01$
AICT → UIT: $\beta = 0.292$, $p < 0.01$

These results indicate that: Perceived Ease of Use (PEOU) has the strongest influence on ICT usage. A unit increase in students' perception that ICT tools are easy to use corresponds to a significant increase in their ICT usage behavior and Perceived Usefulness (PU) also significantly predicts ICT usage. This suggests that students who believe ICT improves their academic performance or productivity are more likely to use it and Availability of ICT Infrastructure (AICT) is another significant predictor. This implies that having adequate access to ICT facilities (e.g., computers, internet, software) enables and encourages students to engage in ICT usage. Therefore, the significance of all predictors supports key constructs of the Technology Acceptance Model (TAM), which posits that ease of use and perceived usefulness are critical factors in users' acceptance of technology. Additionally, the inclusion of ICT infrastructure highlights the role of contextual or environmental enablers in influencing technology adoption.

The findings suggest that for institutions aiming to improve ICT integration and usage among students, it is crucial to:
Ensure ICT tools and platforms are user-friendly and intuitive.
Communicate the academic benefits of ICT tools to students.
Invest in and maintain reliable ICT infrastructure.

4.3 Independent Samples t-Test

An independent samples t-test was conducted to examine gender differences in the constructs of Perceived Ease of Use (PEOU), Perceived Usefulness (PU), and Attitude towards ICT (AICT). The results are presented in Table 1.

Table 1

Gender Differences in Mean Scores of PEOU, PU, and AICT				
Variable	Male Mean	Female Mean	t-value	p-value
PEOU	4.01	3.78	2.16	.032*
PU	3.92	3.89	0.41	.682
AICT	3.45	3.81	-2.73	.007*

Note: PEOU = Perceived Ease of Use; PU = Perceived Usefulness; AICT = Attitude towards ICT. Significant at $p < .05$.

The analysis revealed a statistically significant difference in PEOU scores between male and female participants, $t(df) = 2.16$, $p = .032$, with males (M = 4.01) scoring higher than females (M = 3.78). This indicates that perceived ease of use had a stronger influence on males.

A significant difference was also observed in AICT scores, $t(df) = -2.73$, $p = .007$, where females (M = 3.81) scored higher than males (M = 3.45), suggesting a stronger attitude towards ICT among female respondents.

No significant gender difference was found in PU scores, $t(df) = 0.41$, $p = .682$.

These findings imply that gender plays a role in shaping users' perceptions and attitudes towards ICT, particularly in terms of perceived ease of use and general attitude toward technology.

5. Discussion

This study investigated the extent to which Perceived Ease of Use (PEOU), Perceived Usefulness (PU), and Availability of ICT Infrastructure (AICT) predict ICT usage (UIT) among students. The regression analysis revealed that all three predictors significantly and positively influenced students' ICT usage, with standardized beta coefficients ranging from 0.281 to 0.317 and p-values less than 0.01. Specifically, PEOU ($\beta = 0.317$, $p < 0.01$), PU ($\beta = 0.281$, $p < 0.01$), and AICT ($\beta = 0.292$, $p < 0.01$) emerged as significant predictors.

The results affirm the relevance of the Technology Acceptance Model (TAM) in the educational context. The strongest predictor, Perceived Ease of Use, suggests that students are more inclined to adopt and utilize ICT tools when these technologies are intuitive and user-friendly. This finding aligns with previous research indicating that ease of use significantly affects individuals' willingness to engage with technology (Davis, 1989).

Similarly, Perceived Usefulness also demonstrated a significant impact on ICT usage. This implies that students are more likely to use ICT when they perceive it as beneficial to their academic work, enhancing learning efficiency and productivity. This outcome corroborates existing literature that highlights perceived usefulness as a key determinant of behavioral intention toward technology use.

The positive influence of Availability of ICT Infrastructure underscores the critical role of environmental factors in shaping technology adoption. Adequate access to ICT resources such as computers, internet connectivity, and digital platforms enables and facilitates students' engagement with ICT. This finding is consistent with studies that emphasize the enabling effect of infrastructural support on ICT integration in educational settings.

Overall, the findings suggest that both individual perceptions and institutional support structures are crucial in fostering effective ICT usage among students. Institutions seeking to enhance ICT integration should prioritize providing reliable infrastructure, ensuring ease of use in ICT tools, and promoting the perceived academic value of technology.

6. Practical Implications

The findings of this study have important practical implications for educational

institutions, policymakers, and technology planners. Firstly, the study highlights the necessity for **gender-sensitive ICT strategies**. Given that male students are more influenced by perceived ease of use, while female students are more concerned with infrastructure availability, institutions should design ICT training programs that address these distinct needs.

For male students, ICT initiatives should focus on:

- Enhancing the usability and user-friendliness of ICT platforms.
- Providing advanced skills workshops that foster innovation, creativity, and mastery of digital tools.
- Offering opportunities for hands-on experience with emerging technologies to further stimulate usage based on perceived ease and utility.

For female students, institutions should:

- Invest significantly in improving the availability and reliability of ICT infrastructure, including providing sufficient computer laboratories, internet connectivity, and accessible devices.
- Develop support systems such as dedicated ICT help desks, mentorship programs, and female-led tech initiatives to encourage usage and sustain engagement.
- Offer awareness campaigns to promote confidence and reduce technology anxiety, ensuring that access and usability are perceived as equitable.

Moreover, creating an inclusive ICT environment entails:

- Conducting regular assessments to ensure that both male and female students' feedback on ICT access and training is captured and acted upon.
- Designing ICT curriculum content that is mindful of diverse learning needs, including flexible use models for students who may have varying levels of prior exposure.
- Partnering with government agencies and private organizations to fund infrastructure projects that target gender-related digital divides.

By **addressing specific gendered needs**, institutions can **bridge ICT usage gaps** and **foster equitable learning environments**, thereby enhancing students' academic performance, digital literacy, and readiness for the future workforce.

This approach is crucial not only for promoting gender equality but also for maximizing the return on investment in ICT infrastructure in educational settings, as more inclusive usage leads to better educational outcomes across the board

7. Conclusion

This study reinforces the relevance of TAM in ICT usage research, emphasizing the moderating role of gender and environmental factors like infrastructure availability. However, students are more likely to use ICT when they find it easy to use, see it as beneficial to their academic tasks, and have adequate access to the necessary technological resources.

8. Recommendations

- Incorporate qualitative methods to gain deeper insights into gender dynamics.

- Implement ICT policies promoting gender equity.

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- Expand the research model with additional psychosocial factors.