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GENDER-BASED DIFFERENCES IN TECHNOLOGY ACCEPTANCE: AN ANALYSIS USING THE TECHNOLOGY ACCEPTANCE MODEL (TAM).

[1]ESEYIN JOSEPH B. [2] NANTOK, PHILIP J.D & [3]NAANDOET FESTUS BUENYEN

[1]ICT Directorate University of Jos, Jos Nigeria. fxeseyin@gmail.com +2348033551034

[2]*(Department of Computer Science, Federal College of Animal Health and Production Technology (VOM), Plateau – Nigeria)* jarmoknantok@gmail.com, +2348060545094

[3]*(Department of Computer Science, Federal College of Animal Health and Production Technology (VOM), Plateau – Nigeria)* naandoetfestus@gmail.com, +2348038144477

Abstract

This research examined gender variation in uptake of Information and Communication Technology (ICT) on the basis of Technology Acceptance Model (TAM). The Taro Yamane formula was used to select a sample of 295 students out of 1,123 in the Federal College of Veterinary and Medical Laboratory Technology, Vom. A structured questionnaire was used to collect data and independent samples t-tests were used to analyse the data. Findings indicated that the perceived ease of use (PEOU) and attitudes towards ICT (AICT) were much higher among males and females respectively. There was no evidence of any significant gender difference in perceived usefulness (PU). The results indicated that gender-sensitive ICT strategies are required to optimise equal technology adoption in the learning institutions.

Keywords: Gender, Technology acceptance, ICT, TAM, PEOU, PU, AICT

1. Introduction

In today's digital age, the successful implementation and use of Information and Communication Technology (ICT) depend significantly on users' attitudes and perceptions. The Technology Acceptance Model (TAM), developed by Davis (1989), has become a widely accepted framework for understanding technology adoption. It focuses on two primary constructs: Perceived Ease of Use (PEOU) and Perceived Usefulness (PU), which influence Attitude towards ICT (AICT) and ultimately predict behavioural intention to use technology.

A growing body of literature suggests that gender may moderate the influence of these constructs. Previous studies (e.g., Venkatesh & Morris, 2000; Ong & Lai, 2006) have highlighted how males and females perceive and interact with ICT differently. However, there remains a need to further explore this issue, especially in developing regions where gender disparities in technology use persist.

Recent academic research has determined to continue to enrich the Technology Acceptance Model (TAM) model by adding gender as a moderating factor through a continuum of online spaces. As an illustration, Setiawan et al. (2023) analysed

the adoption of fintech by using an extended TAM and validated the moderating role played by gender on the usefulness and the intention to use it. Similarly, Zhang, Ali, and Kanesan (2022) found that there were gender disparities in the intentions toward electric-vehicle (EV) adoption through a longer TAM. In the education field, Zhang et al. (2023) found that gender mediated acceptance of artificial-intelligence (AI) tools among pre-service teachers, and Toraman and Geçit (2023) found that there are big differences in the adoption of the Metaverse through the TAM based on gender.

Smeda, Shiratuddin, and Wong (2022) showed that gender has an impact on the e-book acceptance of mathematics and statistics students. According to Asghar et al. (2023), TAM was combined with the leadership development and gender turned out to be an influential factor on social-media-based education. Nahar (2022) also found that online payment adoption is informed by gender differences among SMEs in Bangladesh. Iddrisu, Alhassan, and Aminu (2024) examined AI writing devices with a sample of university students and discovered gender to be a predictor of the perceived usefulness and adoption behaviour. Kobane (2023) transformed the TAM into e-commerce uptake in Lesotho, in which men and women vary intheir intentions to trust and use technologies. Lastly, gender was validated as a moderate variable in the adoption of e-learning, with a 2023 article in the Italian Journal of Educational Technology on learning-management-system acceptance.

Taken altogether, these studies affirm that gender still plays a role in the process of technology acceptance in different settings, hence the interest of the present study in gender-specific differences in TAM constructs.

This study aims to investigate gender-based differences in PEOU, PU, and AICT among users, contributing to the literature on digital inclusion and effective technology adoption strategies.

2. Method

2.1 Participants

The study population comprised 1,123 students of the Federal College of Veterinary and Medical Laboratory Technology, Vom, Jos-South, Nigeria. To determine the sample size, the Taro Yamane (1967) formula was applied:

$$n = \frac{N}{1 + N(e)^2}$$

A population of 1,123 students of the Federal College of Veterinary and Medical Laboratory Technology, Vom, Jos-South, Nigeria, formed the study population. In calculating the sample size, Taro Yamane (1967) formula was used:

Where:

- n= sample size
- N = population size (1123)
- e = margin of error (0.05)

$$n = \frac{1123}{1 + 1123(0.05)^2} = \frac{1123}{1 + 2.8075} = \frac{1123}{3.8075} \approx 295$$

Therefore, a stratified random sampling was used to select a sample of 295 participants to balance the number of participants by gender. Among the 295 distributed questionnaires, 283 were returned and analysed which is equivalent to 95.9 response rate. The last sample was composed of 144 men and 139 women.

2.2 Instrument

Three constructs of the Technology Acceptance Model (TAM) were measured using a structured questionnaire, which included:

- Perceived Ease of Use (PEOU)
- Perceived Usefulness (PU)
- Attitude towards ICT (AICT)

All constructs were measured using validated items based on the work by Davis, (1989) and other researchers, which were rated on a 5-point Likert scale (1 = strongly disagree, 5 strongly agree). Cronbach alpha was used to establish the reliability of the instrument, and the results were 0.82 (PEOU), 0.79 (PU) and 0.85 (AICT), all above the acceptable level (a value higher than 0.70).

2.3 Procedure

The questionnaires were distributed in paper format during lecture sessions so that maximum participation is achieved. Involvement was voluntary and anonymous and the respondents gave informed consent. The institutional review board of the Federal College of Veterinary and Medical Laboratory Technology, Vom gave ethical approval.

2.4 Data Analysis

Answers to questionnaires were coded and analysed using SPSS (version 25). The responses were summarised using descriptive statistics (mean and standard deviation). Independent samples t-tests were used to test the differences between genders in the variables of PEOU, PU, and AICT, and the level of statistical significance was set at p =.05.

3. Results

Table 1 shows the difference between the mean score of PEOU, PU, and AICT according to gender.

Table 1 Differences in the mean scores of PEOU, PU and AICT by Gender.

Variable	Male Mean	Female Mean	t-value	p-value
PEOU	4.05	3.81	2.31	.021*
PU	3.94	3.90	0.47	.639
AICT	3.52	3.86	-2.59	.010*

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

The findings revealed that:

- **Males reported higher PEOU** than females, t(281) = 2.31, p = .021.
- **Females reported stronger AICT** than males, t(281) = -2.59, p = .010.
- No significant gender difference was observed in PU, t(281) = 0.47, p = .639.

4. Discussion

This paper examined the gender difference in technology acceptance through TAM among the Vom students. As in previous research (Venkatesh and Morris, 2000; Ong and Lai, 2006), males had higher scores on perceived ease of use (PEOU), which shows more confidence when using ICT tools. On the other hand, females showed a higher attitude towards ICT (AICT), whereby, despite the usability barriers that may exist, they show more enthusiasm and willingness

to learn ICT in an environment that is well supported.

Interestingly, gender difference was not established in the perception of usefulness (PU), which is consistent with Davis (1989) and indicates that males and females equally realise the usefulness of ICT in the learning process. This highlights the importance of ICT adoption strategies that consider the usability issues faced by females whilst strengthening the existing positive attitudes they possess.

These findings highlight the importance of gender-sensitive ICT policies that aim to improve female users' ease of use experiences by providing specific training and mentorship to them and maintaining positive attitudes.

Enhanced Limitations and Future Research:

The study has been limited to one educational institution, which is a situation that can limit the generalisation of the results to a wider population. Future investigations should include a range of colleges or universities with different geographical locations, thus making it possible to achieve a range of socio-cultural and technological ecosystems. Furthermore, the reliance on self-reported information is characterised by the threat of response bias, where the respondents may exaggerate or underrate their attitudes and experience in the field of information and communications technology (ICT). Mixed-method approaches should therefore be employed in future research to combine quantitative survey research with qualitative interview or focus group research strategies to provide more detailed information. Besides this, further investigation into other moderating factors (age, disciplinary affiliation, socioeconomic status, antecedent ICT exposure and digital literacy level) would help in obtaining a deeper understanding of the impact of gender on technology acceptance. Lastly, longitudinal designs can be recommended to track the change of gender perceptions towards ICT across time, especially as the policies of digital inclusion persist in their metamorphosis.

The limitations and future research.

The study was restricted by a single unit focus, which can limit the generalizability. Self-reported data can be a source of bias as well. The following studies should be extended to many institutions, employ multifaceted research methodologies, and include other moderating variables like age, field of study and their previous exposure to ICT.

5. Conclusion

The researcher came up with gender variations in technology acceptance between students of the Federal College of Veterinary and Medical Laboratory Technology, Vom. Although males expressed greater perceived ease of use, females expressed stronger attitudes towards ICT, and there was no difference in perceived usefulness. Such results indicate that men and women have different attitudes towards technology adoption. Inclusive ICT training programmes and environments that offer assistance are vital in helping to address these differences to promote equitable digital engagement in educational institutions.

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