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EXPLORING GENDER AS A CORRELATE OF UNDERGRADUATES' INTEREST IN SCIENCE AND TECHNOLOGY EDUCATION

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Abstract

This study investigates how gender correlates with undergraduates' interest in science and technology education. Consequently, a correlational research design was implemented for the study. Two research questions and two hypotheses guided the study. The population for this study comprised all 765 undergraduates of Science and Technology Education at Rev. Fr. Moses Orshio Adasu University, Makurdi. A sample of 158 undergraduates (91 female & 67 male), selected using a multistage sampling technique, was used for the study. Gender and Interest in Science and Technology Questionnaire (GISTQ), with a reliability coefficient of 0.974, determined using Cronbach's Alpha, was employed as an instrument for data collection. The data generated were analysed using Pearson Product Moment Correlation (PPMC). The findings of the study revealed that there is no statistically significant correlation between gender (whether male or female) and undergraduates' interest in science ($p = .316 > .05$, and $p = .190 > .05$; for males and females, respectively). However, the study further reveals that while the correlation between female undergraduates and interest in technology was not statistically significant ($p = .316 > .05$), there existed a statistically significant correlation between male undergraduates and interest in technology ($p = .316 > .05$). Therefore, the study concluded that gender does not correlate with undergraduates' interest in science, however, there exists a disparity in undergraduates' interest in technology based on gender in favour of males. The study recommended, among others, that universities should initiate campaigns to raise awareness about the importance of gender diversity in science and technology education.

Keywords: Gender, Interest, Science Education, and Technology Education

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Introduction

Science and technology education at the university level is essential for fostering innovation and addressing the complex challenges of the modern world. In this technologically advanced economy, the domains of science and technology are essential to competitiveness on a national and international level (Tyler-Wood et al., 2018). Undergraduates in the fields of science and technology are equipped with advanced knowledge and skills necessary for developing new technologies and scientific advancements that drive economic growth and societal progress (Loyalka et al., 2021; Rieckmann, 2018). University programs offer a rigorous curriculum that encourages critical thinking, promotes research, and enhances problem-solving abilities, preparing graduates to tackle global issues such as climate change, healthcare, and digital transformation. Moreover, higher education serves as a crucible where interdisciplinary collaborations and cutting-edge research flourish, ensuring that students are not only knowledgeable but also capable of contributing meaningfully to technological and scientific fields (Judijanto et al., 2024). Science and technology-based education is designed to provide students with problem-solving skills that will enable them to proffer solutions to global issues even after they enter the workforce (Septiyanto et al., 2023). The growing demand for skilled professionals in science and technology fields has highlighted the need to attract a diverse range of students, particularly undergraduates (Galvez et al., 2024; Duran & Lopez, 2015). This comprehensive educational phase is crucial for cultivating the next generation of leaders and innovators in science and technology. Hence, undergraduates' interest and active participation in these fields becomes imperative.

Interest is often regarded as a motivational construct that guides a person's focus and propels actions associated with particular things, events, and stimuli. It is a fundamental driver in shaping the educational and career trajectories of students, particularly in fields like science and technology (Mouton et al., 2023). Interest not only motivates students to engage with their studies but also affects their persistence in these fields. It is often associated with feelings or emotions that make students focus their attention on concepts and principles of a field (Ayua et al., 2021). Students' interest in science and technology encompasses the feeling, curiosity, willingness, or persuasion of students wanting to know about science and technology and their longing and readiness to be actively involved in the learning, principles, and practice of these fields (Ayua et al., 2025; Ammar et al., 2024). Genuine interest in scientific and technological concepts among undergraduates increases their likelihood of gaining skills and competencies. Interest is a critical factor in the learning process, as learners will be more engaged in learning science and technology if they are interested in acquiring scientific and technological skills and competencies (Rotgans & Schmidt, 2017; DuBof, 2020). The importance of interest in science and technology cannot be overemphasized, this is because students of both genders are more invested in their own learning if they have a personal interest in the topics covered, as interest plays a significant role in the learning process.

Gender divides have existed since the beginning of time and have been the subject of numerous scholarly discourses. Naturally, gender could encompass the characteristics associated with being male or female, man or woman, boy or girl (Ayua & Agbidye, 2020). Thus, gender as used in this study refers to the male or female identity of university students pursuing their first degree, encompassing the social, cultural, and personal aspects associated with being male or female in the context of higher education. According to Danjuma (2015), as cited in Ikyernum et al. (2022), gender disparity globally militates against equitable participation of males and females in STEM education, especially in Africa. By implication, gender differences hinder equal opportunities for both males and females to fully participate and thrive in science and technology, subsequently leading to inequitable educational and career outcomes. Ali et al. (2014) submitted that females face several inequitable difficulties that limit their potential in participation in the

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Sciences. Consequently, recent research indicates that the number of science and technology graduates is increasing; however, male students continue to strongly outnumber females in some STEM fields (Tyler-Wood et al., 2018). Similarly, Kanny et al. (2014), as cited in Tyler-Wood et al. (2018) reported that despite a narrowing of gender differences in science fields, females are generally underrepresented in STEM programs. This reveals that gender peculiarities affect students' interest in the teaching and learning of science and technology concepts.

Empirically, Osagie and Alutu (2016) in their study "Factors Affecting Gender Equity in the Choice of Science and Technology Careers Among Secondary School Students in Edo State, Nigeria" found a lower interest in science and technology among female students compared to their male counterparts. In contrast, Jia et al. (2020) in their study "The Gender Differences in Science Achievement, Interest, Habit, and Creativity" surprisingly found that girls had a significantly higher interest in science compared to their male counterparts. However, Tyler-Wood et al. (2018) in their study "Factors Influencing Student STEM Career Choices: Gender Differences" established that there were no significant differences between males and females in interest in STEM careers.

In other studies, Hamza et al. (2019), in their study "Gender Differences in the Adoption of Self-Service Technologies Among Students," reported a statistically significant positive correlation between male gender and undergraduates' interest in technology, indicating that male students exhibit a greater interest in technology than their female counterparts. Likewise, Ogunbodede and Oribhabor (2022) investigated gender disparities in the use of digital resources among undergraduates at the University of Africa, Toru-Orua (UAT), and Ignatius Ajuru University of Education (IAUE), both located in Southern Nigeria. They found out that male students were significantly more likely to use digital resources compared to female students. Furthermore, Nwajiuba and Ukwandu (2021) in their study "Female ICT participation in South-Eastern Nigerian Tertiary Institutions: Inhibiting Factors" discovered that many female students expressed interest in ICT but faced structural barriers such as high costs, societal perceptions, high level of male dominance and lack of mentorship that discouraged their participation. They explained that although interest may exist among females, external factors limit their technological engagement.

Research has consistently shown that gender-based stereotypes can influence educational choices and career aspirations (Makarova et al. 2019). Traditionally, science and technology fields have been viewed as male-dominated domains, potentially discouraging female students from pursuing these areas. As societies strive for greater inclusivity and diversity, understanding how gender influences students' interests in science and technology education is crucial (Geesa et al. 2021).

Statement of the Problem

Science and technology education at the university level plays a pivotal role in fostering innovation, addressing the modern world's complex challenges, and driving economic growth and societal progress. However, despite its ever-increasing importance, researchers worldwide have called for attention to emphasize developments in undergraduate STEM education. Much of the attention is drawn to the persistent underrepresentation of females in STEM-related programs, and reasons that contribute to students dropping out of STEM careers, including but not limited to students' interests, the nature of educational environments, and the teaching-learning practices employed (Ammar et al., 2024). The underrepresentation of diverse groups in science and technology education remains a significant challenge in higher education (Blackburn, 2017). Gender disparities in science and technology education highlight a persistent issue, with female students often expressing less interest in STEM programs compared to their male counterparts. This gap raises important questions about the underlying factors influencing students'

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interest and engagement in science and technology disciplines. Although there has been extensive research over the years on the gender gap issue conducted in a wide cross-section of disciplines, including STEM, yet, the relationship between gender and undergraduates' interest in science and technology is less understood. As part of the continuous effort to narrow the gender gap in Science Technology, Engineering, and Mathematics (STEM), it is therefore pertinent to understand the role of gender on undergraduates' interest in science and technology education, hence the current study.

Objectives of the Study

I. To investigate the correlation between Gender and undergraduates' interest in science education.

II. To determine the correlation between Gender and undergraduates' interest in technology education.

Research Questions

I. What is the correlation between Gender and undergraduates' interest in science education?

II. What is the correlation between Gender and undergraduates' interest in technology education?

Hypotheses

I. There is no significant correlation between Gender and undergraduates' interest in science education.

II. There is no significant correlation between Gender and undergraduates' interest in technology education.

Method

The study was carried out using a correlational research design. This choice was to enable the study to measure the strength and direction of the linear relationship between gender and interest in science and technology, and also allow for the investigation of the extent of the relationship between the variables. The population of the study comprised all the 765 undergraduates of Science and Technology Education in the 2023/2024 academic year at Rev. Fr. Moses Orshio Adasu University, Makurdi. From this population, a sample size of 158 (91 female & 67 male) was drawn using a multistage sampling**.** The Gender and Interest in Science and Technology Questionnaire (GISTQ) was developed and used for data collection. The questionnaire comprised three sections: A, B & C; section "A" collected data on the demography of the respondents, whereas sections "B & C", comprising 15 test items each, elicited data on undergraduates' interests in science and technology respectively. GISTQ was face and content validated and trial-tested, yielding a reliability coefficient of 0.97 determined using Cronbach's Alpha method. Data generated from the GISTQ were analysed using Pearson Product-Moment Correlation (PPMC) to answer both the research questions and to test the study's null hypotheses at 0.05 α-level. PPMC was adopted for data analyses because the variables were measured on continuous scales and the data was normally distributed with no significant outliers.

Results

The results of the study were presented in order of the research questions and hypotheses as follows:

Research Question One: What is the correlation between Gender and undergraduates' interest in science?

Table 1: Correlation between Gender and Undergraduates' Interest in Science.

Variable Pair	Pearson Correlation (r)	N	Interpretation
Female & UIS	0.106	91	Weak positive
Male & UIS	0.162	67	Weak positive
Total		**158**	

Table 1 presents Pearson correlation coefficient between female gender and interest in science, r = 0.106, indicating a very weak positive correlation. The table also shows the correlation between Male gender and interest in science, r = 0.162, which also shows a weak positive correlation. This implies that gender does not appear to be a strong predictor of interest in science among the undergraduates in Makurdi.

Research Question Two: What is the correlation between Gender and undergraduates' interest in technology?

Table 2: Correlation between Gender and Undergraduates' Interest in Technology.

Variable Pair	Pearson Correlation (r)	N	Interpretation
Female & UIT	0.170	91	Weak positive
Male & UIT	0.284	67	Moderate positive
Total		**158**	

Table 2 shows the Pearson correlation coefficient between gender and interest in technology (UIT), r = 0.170, indicating a weak positive correlation. This means there is a weak positive correlation. While male gender and interest in technology show a correlation of r = 0.284, indicating a moderate positive correlation between male gender and interest in technology among the undergraduates in Makurdi.

Hypothesis One: There is no significant correlation between Gender and undergraduates' interest in science.

Table 3: Significance of the Correlation between Gender and Undergraduates' Interest in Science

Variable Pair	N	Sig. (2-tailed)	Interpretation
Female & UIS	91	0.316	Not Significant
Male & UIS	67	0.190	Not Significant
Total	**158**		

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Table 3 shows that both correlations are not statistically significant, as their p-values (0.316 and 0.190) are greater than 0.05. This means we cannot confidently assert that a real relationship exists between gender and interest in science. This implies that there is no statistically significant correlation between gender (whether male or female) and undergraduates' interest in science. Although the correlations are slightly positive, they are weak and not meaningful at the 0.05 level of significance.

Ho_2: There is no significant correlation between Gender and undergraduates' interest in technology.

Table 4: Significance of the Correlation between Gender and Undergraduates' Interest in Technology

Variable Pair	N	Sig. (2-tailed)	Interpretation
Female & UIT	91	0.107	Not Significant
Male & UIT	67	0.020	Significant
Total	**158**		

Table 4 shows the correlation of female gender and interest in technology, with a p-value = 0.107, which is not statistically significant. This means there is no strong evidence that females' interest in technology is related to gender. While male gender and interest in technology show a p-value = 0.020, which is statistically significant at the 0.05 level. This indicates a significant relationship between male gender and interest in technology among the undergraduates. This suggests that there is a statistically significant positive correlation between being male and undergraduates' interest in technology, suggesting that male students tend to have higher interest in technology compared to females. For females, the correlation is positive but weak and not significant.

This implies that gender may play a role in undergraduates' interest in technology, particularly showing a stronger link for males.

Discussion of Findings

The correlation between gender and undergraduates' interest in science education was found to be positively weak and not significant in both male and females. This finding depicts that gender, either male or female, is not a predictor of undergraduates' interest in science in Makurdi. This finding is consistent with that of Tyler-Wood et al. (2018), who established that there were no significant differences among males and females on interest in STEM careers. However, this finding is in contrast with that of Jia et al. (2020), who found out that girls had a significantly higher interest in science compared to their male counterparts. Likewise, the finding does not align with the finding of Osagie and Alutu (2016), who reported a lower student interest in science and technology among female students compared to their male counterparts, with only 38% of female students expressing interest compared to 65% of male students. This outcome could be attributed to different sociocultural contexts and educational stages since Osagie and Alutu studied secondary school students, while the current study focuses on undergraduates. Evidence gathered from the current study and the reviewed studies calls for the need to foster interest among undergraduates in science. Therefore, there is a need to initiate educational strategies that enhance students' interest and engagement in science.

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Also, the correlation between gender and undergraduates' interest in technology education was found to be positively weak and not significant among the females but moderately positive and significant among the male undergraduates. This finding is in agreement with that of Hamza et al. (2019), who reported a statistically significant positive correlation between male gender and undergraduates' interest in technology, indicating that male students exhibit a greater interest in technology than their female counterparts. The outcome from the two studies explicates that there is a statistically significant positive correlation between being male and undergraduates' interest in technology, suggesting that male students tend to have a higher interest in technology compared to females. More so, Ogunbodede and Oribhabor (2022) found that male students utilized digital resources more frequently and confidently than females, which suggests a stronger engagement with technology among males, consistent with the present study. However, the finding does not agree with that of Tyler-Wood et al. (2018), who reported no significant differences among males and females on interest in STEM careers. Also, Nwajiuba and Ukwandu (2021) observed that many female students expressed interest in ICT but faced structural barriers such as high costs, societal perceptions, and lack of mentorship that discouraged participation. This suggests that although interest may exist among females, external factors limit their technological engagement, making the male-favoured correlation found in the current study more reflective of actual participation than underlying interest.

Conclusion and Recommendations

Based on the findings of the study, it was concluded that: gender has no correlation with undergraduates' interest in science, however, there exists a disparity in undergraduates' interest in technology based on gender in favour of males. To this end, the following recommendations were made:

1. The university should initiate campaigns to raise awareness about the importance of gender diversity in science and technology education.
2. Educators should Provide platforms that will enhance student interest, particularly among those who may feel marginalized in traditional STEM settings.
3. Educators should adopt teaching strategies that are free from gender bias and encourage equal participation from all students by making learning environments more inclusive and engaging for both males and females.
4. Universities should promote gender-inclusive technology programs and interventions such as workshops, mentorship, and awareness campaigns to encourage and support female undergraduates' participation and interest in technology-related fields.

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