

Technical Vocational Education Training and Entrepreneurship Redesigning a Pathway for Female Students in Technological Institutions in Southwest Nigeria

Oshotoye Adedayo Bradford & Ganiyu Akeem Adewale

Faculty of Social Management and Humanities and Faculty of Business and Communication studies,

The Polytechnic, Ibadan Oyo State

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ABSTRACT

This study focuses on redesigning a pathway for female students in technological institutions in Southwest Nigeria with the aim of promoting gender diversity and entrepreneurship in science, technology, engineering and mathematics (STEM) fields. The research identifies the challenges faced by female students in pursuing technological education and entrepreneurship, explores successful models from other regions, and proposes innovative strategies to enhance female participation and success. The objectives include designing interventions, assessing impact, creating a roadmap for implementation, and advocating for policy changes. By addressing gender disparities and creating a supportive environment, this project seeks to empower female students to excel in technology-related disciplines and contribute to the advancement of the entrepreneurial ecosystem in southwest Nigeria.

This cross-sectional study was conducted from July 2023 to February 2024 among students from various technological higher institutions, using a convenience sampling technique. The calculated total sample size was 312. A pretested self-administered questionnaire was used for the data collection. Analysis was done using percentage, binary logistic regression and multinomial logistic regression.

67.2% of the respondent experienced challenges in inclusion and supportive environment for Technological related program and not willing to continue with their career. Also 33 % of the respondent inclined to ascent to such career. Among them 32%, 31% and 37% were science, management and engineering students, respectively. There was a statistically significant association between entrepreneurship skills and building career on Technological education program

Keywords: Entrepreneurship, Technological Institutions, Female Students, Southwest Nigeria

INTRODUCTION

In the realm of entrepreneurship, fostering an inclusive and supportive environment for female students in technological institutions is crucial for promoting diversity and innovation. In southwest Nigeria, where gender disparities persist in science, technology, engineering and mathematics (STEM) fields, redesigning pathways for female students can pave the way for increased participation and success in technology-related disciplines. By implementing targeted strategies such as mentorship programs, networking opportunities, and curriculum enhancements, such mitigation empower female students to pursue their entrepreneurial

aspirations and contribute meaningfully to the technological landscape. This project aims to explore and develop initiatives that will not only bridge the gender gap in technological institutions but also create a more equitable and conducive environment for female entrepreneurs to thrive.

The technical and vocational education and training (TVET) system will always be seen as the foundation of industry and technology in any country where it is implemented with remarkable success and accomplishment. TVET's primary purpose is to train vocational educators; however, it can also address entrepreneurship education, which will have a significant impact on the development of serious entrepreneurs prepared to support the long-term viability of a technologically oriented economy (European Commission, 2013; Kissi, Adjei-Kumi, Debrah, Ahadzie, & Neal, 2020; Halliru, Yusri, Umar, & Abdullahi, 2021; Yeap, Suhaimi & Nasir

Women form the greater percentage in African countries. Yet, they are not adequately integrated into the society in terms of human development in science and technology, which has resulted in the increase in poverty level in the continent. Organization of Economic Co-operation and Development (OECD) 2030, among its challenges, is to end poverty between now and 2030, promote gender equality, and empower women and girls (OECD, 2016). (World Development Report March 2012, Vol. 49, No. 1: Gender Equality and Development) cited that Even though women are not given equal treatment in our societies, they have contributed immensely to the development of our countries

The study, aim investigated the intersection of Technical and Vocational Education and Training (TVET) with Entrepreneurship, specifically focusing on redesigning a pathway for female students in technological institutions in Southwest Nigeria. The goal was to identify ways to enhance the participation and success of female students in TVET programs, ultimately empowering them to become successful entrepreneurs.

OBJECTIVES

- To identify the current challenges faced by female students in pursuing technological education and entrepreneurship in southwest Nigeria.
- To explore successful models from other countries that have effectively supported and empowered female students in STEM fields.
- To design innovative interventions that can enhance the participation, retention, and success of female students in technological institutions.
- To advocate for policy changes that will encourage and support female students in technological education and entrepreneurship program.
- Develop a detailed plan for rolling out and assessing the revised program designed to support female students, including identifying essential stages, required resources, and engaging relevant stakeholders.

LITERATURE REVIEW

From the history of Western education, women have been perceived as weaker than men. This idea prompted the Marxist to state that oppression of women through socialist inequalities and ownership of women by men will end only when a communist society has been established. This will free women from the economic functions presently undertaken by families and those economic functions will be taken over by the state (Peter & Dennis, 2002. Plato later stated in his work, universal education for both genders is needed to produce good citizens. He further noted that physical training and horsemanship should be seen as appropriate for both genders. Plato later made some reservations about women, that they had an „inherent weakness of the soul“ and mischief-makers. He opined that men should become soldiers and females destined to become mothers and take domestic duties. Therefore, girls should learn arts and knowledge that would be useful in running a home. The early Christian educators hold a contradictory idea about female education. According to Kersey (1981), girls shouldn't play with the boys but rather engage themselves in

learning skills and handicrafts. Vives, a humanist, on the other hand, advocated for education for women to make them suitable companions in marriage

Gender disparities in STEM fields have long been a global concern, with female students facing numerous challenges in pursuing technological education and entrepreneurship. Studies have highlighted the underrepresentation of women in STEM disciplines, attributed to factors such as societal stereotypes, lack of role models, and institutional biases. In Nigeria, particularly in southwest regions, these challenges are exacerbated by cultural norms and limited access to resources for female students.

UNESCO's Institute of Statistics (*Fixing the Broken Promise of Education for All: Findings from the Global Initiative on Out-of-School Children*. (2015). <https://doi.org/10.15220/978-92-9189-161-0-en> reports that of all regions, sub-Saharan Africa has the highest rates of education exclusion. Over one-fifth of children between the ages of 6 and 11 are out of school, followed by one-third of youth between the ages of 12 and 14. According to UIS data, almost 60% of youth between 15 and 17 are not in school. Girls' education is a significant priority. Across the region, 9 million girls between the ages of 6 and 11 will never go to school at all, compared to 6 million boys, according to UIS data. Their disadvantage starts early: 23% of girls are out of primary school compared to 19% of boys. By the time they become adolescents, the exclusion rate for girls is 36% compared to 32% for boys (UNESCO, 2019). In Kenya, enrollment data shows that 5% out of 30% of women in Vocational institutions enroll in courses like engineering and construction, etc. In comparison, the rest, 25%, enroll in courses like secretarial studies, nurses (Chege & Karuki, (2014). Nearly one in every four women in sub-Saharan Africa is a Nigerian due to its sheer size in Africa (Uzoma, 2013)

Research on successful interventions for promoting gender diversity in STEM fields has shown the effectiveness of mentorship programs, networking opportunities, and targeted support initiatives. Studies from other regions have demonstrated that creating a supportive environment and implementing tailored strategies can significantly enhance female participation and success in technology-related disciplines.

In the context of entrepreneurship, empowering female students in technological institutions is crucial for fostering innovation and economic growth. (World Review of Business Research Vol. 6. No. 1. March 2016 Issue. Pp. 161 – 178 by kalpana R. Ambepitiya) reported female entrepreneurs bring unique perspectives and skills to the table, leading to more diverse and sustainable businesses. By redesigning pathways for female students in southwest Nigeria, this study aims to build on existing literature and contribute to the advancement of gender equality and entrepreneurship in STEM fields.

RESEARCH METHODOLOGY

Design

This Study used a Sequential Exploratory Design. The purpose of Sequential survey was to explore the experiences, perspectives, challenges, and aspiration, also and validate the findings from the qualitative phase and gather statistical data on factors influencing the pathways of female students in technological institutions. The study was essentially to investigate the effect among female technology students at various public and private higher institutions in the South West, Nigeria

Participants and Data Collection

The technique adopted for selection of the sample was being multistage random selection procedure for undergraduate female students. There were 312 participants. Of these, 32% were science students, 31% management students while 37% are engineering student's. Their age ranges from 18-36 years, with a mean age of 27. Administer surveys to a larger sample of female students to collect data on demographics,

academic performance, career aspirations, support systems, and challenges

Instrument

Research instrument used to collect data for the study was structured questionnaire consisting of four section labelled A, B, C. The questionnaire was specifically designed to accomplish the objectives of the study. The section A consisted of demographic information such as age, course enrollment patterns, academic records, retention rates, marital status. The second section contained the items, and was divided into four parts.

Section Section A. **Academic motivation Scale the scale adopted and modified from Vallerand, R. J., Pelletier, L. G., Blais, (2014)** the scale was design to measure intrinsic and extrinsic motivation of academic pursuit. It consist of 28 items. It is a 5-point Likert (attitudinal scale): =Strongly Agree SA; Agree = A; disagree = D: Indifferent= I Strongly Disagree = SD. The overall reliability co-efficient of the instrument yielded an $r = 0.76$ Cranach alpha

Section B. **The Perceived Social Support- Friends Scale (PSS-Fr) and Perceived Social Support-Family (PSS-Fa) (Procidano & Heller, 1983)** are two 20-item and 19-item instruments to measure fulfillment of social support from friends and family. The normative data that derived in this instrument was from a sample of 222 (mean age=19 years) undergraduate psychology students. This instrument has 3-point Likert-type scale which are “Yes”, “No”, and “Don’t know”. The reliability found for the PSS-Fr and (PSS-Fa) with alphas ranging from 0.88 to 0.91 and 0.84 to 0.90.

Section C. **Career Resources Questionnaire CRQ Marciniak, J., Hirschi, A., Johnston, C.S., & Haenggli, M. (2020)** Using a four likert scale. The scale consist of 10 statements about the workers, it is general sense of perceived self-efficiency. The reliability valued from 0.80 which is the internal consistency of the questionnaire

Procedure

The researcher moved round to the fourteen higher Institutions in the Southwest,Nigeria (Public & Private) in the study and administered the instrument to female students after the approval from the appropriate quarter. Following the instructions on the instrument, the questionnaires were filled and returned.

Statistics

Excel for quantitative data analysis, including descriptive statistics, correlation analysis, regression analysis, and data visualization adopted for the analysis.

DATA ANALYSIS AND INTERPRETATION

Table 1 showing the age of the respondents

Age	Number	Percentile
18-23	80	25
24-29	132	42
30-35	100	32
Total	312	100

Interpretation: The table shows the age of the respondents. Out of 312 respondents 25% belonging to the age group of 18-23, 42% belonging to 24-29 and 32% for 30-35.

Table 2 showing the type of Institution

Preference	Number	Percentile
Government Institutions	09	64
Private Institutions	05	36
	14	100

Source: Primary Data

Interpretation: The table shows the type of educational institution. 64% of respondents are studying in Government Institutions, while 37% are studying in private institution

Table 3 showing the worry about Career

Option	Number	Percentile
No	192	18
Yes	120	82
Total	312	100

Source: Primary Data

Interpretation: The table shows the concern of female students regarding the entrepreneurship technology career. 82% respondents agreed that they were very much worried about building career in technology line while 18% are not having this problem.

Table 4 showing the motivational tool for entrepreneurships program

Option	Number	Percentile
No	82	52
Yes	75	48
Total	312	100

Source: Primary Data

Interpretation: The above table shows, whether the motivation strategy from the institution encourages involvement in the program or not. 48% of respondents opined that some strategies act as a motivational tool while 52% did not agree to that

Table 5 showing the policy and the gender effect

Option	Number	Percentile
Role Models	12	7
Gender Bias	18	11
Resources accessibility	12	7
Societal norms	22	14

Low Retention Rates	43	27
Level of Opportunities	19	12
Technology awareness	31	22
Total	312	100

Table 6 showing Perceived Social Support from friends and family

Option	Number	Percentile
Family	112	71
Friends	14	10
Others	31	19
Total	312	100

Source: Primary Data

Interpretation: The table shows the Perceived Social Support from friends and family. Out of 312 respondents, 71% received supports their career while 29% perceived no support in their career

FINDINGS

Based on research and analysis conducted on the current situation of female students in technological institutions in southwest Nigeria, the following findings have been identified:

1. **Low Enrollment Rates:** Female students are significantly underrepresented in technology related programs in the region, leading to low enrollment rates compared to their male counterparts.
2. **Societal Norms and Stereotypes:** Societal norms and stereotypes play a significant role in discouraging female students from pursuing education and careers in technology. There is a perception that technology fields are more suitable for males, leading to a lack of encouragement for female students.
3. **Lack of Role Models:** Female students often lack access to female role models in the technology industry, making it challenging for them to envision themselves succeeding in this field.
4. **Limited Access to Resources:** Female students face challenges in accessing resources such as mentorship, networking opportunities, and skill development programs that are essential for their growth and success in technology.
5. **Gender Bias:** Gender bias and discrimination exist in technological institutions, creating a hostile environment for female students and hindering their academic and professional advancement.
6. **Low Retention Rates:** Female students who do enroll in technology programs often face high dropout rates due to a lack of support, encouragement, and a sense of belonging in the male-dominated environment.

These findings highlight the urgent need to redesign the pathway for female students in technological institutions in southwest Nigeria to address these challenges and create a more inclusive and supportive environment for their participation and success in the field of technology.

RECOMENDATIONS

Based on the findings regarding the underrepresentation and challenges faced by female students in

technological institutions in southwest Nigeria, the following recommendations are proposed to redesign the pathway for female students:

1. **Promote Awareness and Advocacy:** Launch awareness campaigns to challenge societal norms and stereotypes that discourage female students from pursuing technology-related education and careers. Advocate for gender diversity and inclusivity in the technology sector.
2. **Establish Mentorship Programs:** Create mentorship programs that pair female students with successful women in the technology industry. This will provide guidance, support, and role models for female students to navigate their educational and career paths.
3. **Enhance Access to Resources:** Increase access to resources such as skill development programs, networking opportunities, and scholarships specifically targeted at female students in technological institutions. This will help bridge the gap and empower female students to succeed in technology fields.
4. **Revise Curriculum:** Redesign the curriculum to be more inclusive and gender-sensitive, incorporating topics that are relevant and engaging for female students. Ensure that the curriculum promotes diversity and provides equal opportunities for all students.
5. **Address Gender Bias:** Implement policies and initiatives to address gender bias and discrimination in technological institutions. Create a safe and supportive environment that fosters the academic and professional growth of female students.
6. **Encourage Industry Partnerships:** Collaborate with industry partners to create internship and job placement opportunities for female students. This will provide real-world experience and exposure to the industry, enhancing their career prospects.
7. **Monitor and Evaluate Progress:** Establish monitoring and evaluation mechanisms to track the progress of female students in the redesigned pathway. Collect feedback from students and stakeholders to continuously improve and refine the initiatives.

By implementing these recommendations, the pathway for female students in technological institutions in southwest Nigeria can be redesigned to create a more inclusive, supportive, and empowering environment that enables female students to thrive and excel in the field of technology.

CONCLUSION

In conclusion, the underrepresentation of female students in technological institutions in southwest Nigeria presents a significant challenge to gender diversity and inclusivity in the field of technology. Addressing this issue requires a concerted effort to redesign the pathway for female students, providing them with the necessary support, resources, and opportunities to succeed in technology related education and careers.

By promoting awareness, establishing mentorship programs, enhancing access to resources, revising the curriculum, addressing gender bias, encouraging industry partnerships, and monitoring progress, a more inclusive and empowering environment can be created for female students in technological institutions. This will not only benefit individual female students but also contribute to the overall growth and innovation potential of the technology sector in the region.

It is essential for stakeholders, including educational institutions, government agencies, industry partners, and the community, to collaborate and implement these recommendations to create a more diverse and inclusive technology ecosystem that leverages the talents and potential of all individuals, regardless of gender. Through collective efforts and a commitment to gender equality, we can pave the way for a more equitable and thriving technology sector in southwest Nigeria

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