

Challenges of Pre-Service Entrepreneurial Skills in Mathematics Education and Their Gender Perspective

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KEYWORDS:

Entrepreneur, challenges, pre-service teachers and Mathematics Education.

WORD COUNT:

195

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ABSTRACT

This study examined the challenges of students' entrepreneurial skills in mathematics education and their gender perspective. The challenges of entrepreneurial skills were categorised into communication, business and personal skills at various levels. The population for the study consisted of all tertiary institutions in Lagos State while the samples include NCE III Mathematics Students. The instrument used for this study was questionnaire designed by the researchers to sought for personal information of the respondent in terms of sex and age with list of twenty items. Four Likert Scale response option was used with option of – Strongly Agree, Agree, Disagree and Strongly Disagree. The questionnaire was face-validated by experts. Cronbach Alpha method was used to determine the reliability of the instrument and the process returned a reliability coefficient of 0.85. The data were analysed using both descriptive statistics (mean, standard deviation and percentages) and inferential statistics(t-test) which was used in testing the hypothesis at 0.05 level of significance. The finding of this study revealed that gender does not in any way influence the entrepreneurial skills acquired by pre-service mathematics teachers and however, recommend that mandatory study of entrepreneurial subject at senior secondary schools before attaining tertiary institution.

HOW TO CITE

Alabi I.A & Chukwulobe I.V. (2024). Challenges of Pre-Service Entrepreneurial Skills in Mathematics Education and Their Gender Perspective. *Educational Perspectives*, 13(1), 231-238.



Introduction

Mathematics is both an essential and contingent part of every human being's daily activity. There are no number expressions that can be changed without using mathematics. Sanni and Alabi (2019), see mathematics as an inevitable element and a liable factor in all human's daily activities. One cannot conclude the last general elections in Nigeria adequately without drawing general or summary conclusions from mathematics. It is considered to be among the most crucial topics in Nigeria's effort to rank among the world's greatest economies by 2020. (Okpala & Anene, 2013).

According to Ajai and Imoko (2015), mathematics is a static and uninteresting topic that seems best suited for nerds and loner boys and men rather than girls and women. In light of the underrepresentation of women in mathematics at the highest levels and other findings, Asante (2010) believes that gender disparities in mathematics education should be of significant concern to scientists. Meanwhile, prior to service, there has always been a perception that instructors only become teachers. Ekwue, Umukoro and Olaniyan (2017) noted that the country's current unemployment crisis may have been exacerbated by pre-service teachers' incapacity to look beyond teaching, leading many of them to settle for low-skilled employment. Thus, entrepreneurial skills can significantly lessen the threat of unemployment. This was supported by Olorundare and Kayode (2014) when they present entrepreneurship as a dynamic process of vision, change, and creation that calls for the application of energy and passion to the development and execution of fresh concepts and inventive fixes.

Divergent and perhaps conflicting perspectives and conclusions can be found in the literature regarding gender concerns in pre-service

mathematics teachers' entrepreneurial abilities. Ekwue, Umukoro and Olaniyan (2017) conducted study to assess the level of entrepreneurial skills possessed by NCE III Mathematics students, having been exposed to entrepreneurship education. A sample of 109 students, comprising of 43 males and 66 females was used for this study. The study's conclusions showed that while pre-service teachers had the communication and business skills necessary for a successful entrepreneurial endeavor, they lacked the personality skills necessary for such activities. Additionally, there was a notable disparity in the degree of entrepreneurial skills between male and female students. The study recommended amongst others the establishment of Entrepreneurial Centre in the school and that the Centre must be made accessible to students.

Ajai and Imoko's (2015) study was to assess gender differences in mathematics achievement and retention by using Problem-Based Learning (PBL). The study involved 428 senior secondary one (SS I) students, comprising of 261 male students and 167 female using multistage sampling from ten grant-aided and government schools. The students were taught algebra using PBL method of instruction. The study revealed that male and female students taught algebra using PBL did not significantly differ in achievement and retention scores, thereby revealing that male and female students are capable of competing and collaborating in mathematics.

Hunt and Song (2013) conducted study on gender and specialty in business management in order to understand why segregation occurs. They took into account the Canadian undergraduate enrollment in the Faculty of Education, which is distinguished by a higher percentage of female students and a tendency of gender segregation in several academic fields. The study found that men and women use the



same standards while choosing a business major, such as success and fit conceptions and referrals from others. But they give these things varying weights according to a gendered pattern.

Studies conducted by Asante (2010) on sex differences in mathematics performance among senior high students in Ghana indicated that boys generally achieved higher than girls on standardized mathematics tests. In addition, this result demonstrated that orientation, not gender, determines performance. According to the studies, PBL should be used by mathematics teachers to improve retention and achievement among both male and female students and to dispel the stereotype that mathematics is only for men.

Olorundare and Kayode (2014) carried out research on entrepreneurship education in Nigerian Universities. The paper develops a paradigm for how entrepreneurship education at Nigerian universities might improve public and private partnerships in the direction of national development. The results show that obstacles to entrepreneurship education in higher education included a lack of resources for the program, insufficient training or entrepreneurship knowledge among university lecturers, problems with curriculum development and implementation, and encounters with university administrators. Recommendations were made regarding how to overcome these obstacles.

Ajala and Alonge (2013) conducted study to access gender issues in basic education and National Development in Nigeria. The results demonstrate that one of the best investments a nation can make in development is in education. Education boosts future prospects and choices for both boys and girls while also increasing the wages of both genders in the future. However, but there are also more socioeconomic benefits

that come from educating girls, benefits that extend to the whole community. These advantages include better health and survival rates for young children and newborns, as well as higher family earnings and economic production. The human capital required for economic progress is developed through education.

Muraina, Lameed, Lesi, Aregbede and Osunloye (2012) examine how gender affects the acquisition of entrepreneurial abilities. Using a survey design approach, 110 entrepreneurial students from two institutions in Lagos State made up the study's sample. Data were gathered by means of a questionnaire. The findings show that parental education, socio-economic status and religious influence have significant impact on entrepreneurial skills attainment of the children. The findings also reveal that being a male or female has nothing to do with marketing related value with regards to choice of entrepreneurial skills.

Statement of the Problem

The global generally is faced with various challenges which Nigeria is not left out. Banabo and Ndiomu (2011) reported that recent global economic meltdown has brought to the limelight and affirm the reality that the world is a global market. This assertion is bound on the pre-service teachers with these global economic challenges which also amount to their development. Nolan (2009) contends that the reason why students face these challenges is because social justice is nonexistent, even in the classroom, where students are allowed to voice their opinions without fear of repercussions. To address these various challenges in the literatures, little or no stance has been directed towards the pre-service entrepreneurial skills and their gender perspective. It is against this bedrock this study examined challenges of



students' entrepreneurial skills in mathematics education and their gender perspective.

Research Questions

The following research questions guided the study:

- How much does a pre-service teacher's gender affect the entrepreneurial skills they learn in mathematics education?
- What level of entrepreneurial skills in mathematics instruction are pre-service teachers' knowledge?
- Which of the entrepreneurial skills that pre-service teachers have gained is valuable to them in the teaching of mathematics?

Hypothesis

- There is no significant difference between the challenges of pre-service entrepreneurial skills in mathematics education with respect to their gender.

Methodology

The research design adopted for this study was descriptive survey on pre-service entrepreneurial skills in mathematics education with respect to their gender. It focused on NCE III students in Mathematics who had attended entrepreneurial course at their 200-level course of study. The study was carried out in one tertiary institution that nurtures pre-service teachers in Lagos State. It provides the researchers with opportunity to sample the views of pre-service mathematics teachers on challenges of entrepreneurial skills they acquired which were categorised into Communication (C), Business (B) and Personal (P) skills at various Level (L). The population for the study consisted of all tertiary institutions in Lagos State while the samples include 108 (comprising of 48 male and 60 female) NCE III Mathematics Students in a College of Education in Lagos State.

The entrepreneur course which is the second-year course for NCE students, exposes pre-service teachers to basic skills required to become entrepreneurs, job creators and also prepares them to be self-employed so as to address the problem of unemployment in the nation. The target sample was all the pre-service teachers' mathematics in their third year in a College of Education in Lagos State. The instrument used for this study was questionnaire designed by the researchers for the purpose of getting information on gender issues of entrepreneurial skills acquired by NCE III Mathematics Students. The questionnaire sought for personal information of the respondent in terms of sex and level with list of twenty questions. Four Likert Scale was used with option of – Strongly Agree, Agree, Disagree and Strongly Disagree.

The questionnaire was face and content validated by some experts in the field of research. Cronbach Alpha method was used to determine the reliability of the items and a reliability coefficient of 0.85 was obtained. The data collected were analysed in the consideration of the research questions and hypothesis. In analyzing the data, both descriptive statistics (mean, standard deviation and percentage bar chart) and inferential statistics. In testing the hypothesis formulated, the t-test analysis was used and it was tested at 5% level of significance. In decision making, mean value of 2.50 and above were agreed while mean value below 2.50 was disagreed.

Results

The results of this study are presented according to the generated research questions in Tables I–III and the hypothesis formulated for the study.



Research Question 1

The question asked that how much does a pre-service teacher's gender affect the entrepreneurial skills they learn in mathematics education? To deal with this question, responses

of the respondents to the questionnaire items were summarized and means and standard deviation in respect of number of males and females that agreed and those that disagreed with each item was computed. Table I gives the summary of these results.

Table I: Mean and Standard Deviation of Pre-Service teachers' entrepreneurial skills

SN	Items	Category	Gender	N	Mean	Std. Dev.	Remark
1	Education in entrepreneurship was more beneficial to female pre-service teachers than to male ones.	P	Male	48	2.90	1.00	Agreed
			Female	60	2.71	0.92	Agreed
2	The understanding of entrepreneurial skills that pre-service mathematics teachers gain is unaffected by gender.	L	Male	48	2.15	0.86	Disagreed
			Female	60	2.11	0.89	Disagreed
3	There is no effect of entrepreneurship education on female pre-service teachers.	P	Male	48	2.67	1.10	Agreed
			Female	60	3.06	0.98	Agreed
4	Pre-service female teachers exhibit a higher degree of self-awareness in entrepreneurship education than do their male counterparts.	L	Male	48	3.11	0.77	Agreed
			Female	60	2.85	0.90	Agreed
5	Pre-service teachers, both male and female, have benefited more from entrepreneurship instruction in terms of personal skill development.	P	Male	48	2.62	0.93	Agreed
			Female	60	2.57	0.92	Agreed
6	Female pre-service teachers can better understand their strengths and weaknesses with the aid of entrepreneurship education.	L	Male	48	2.77	0.90	Agreed
			Female	60	2.81	0.91	Agreed
7	Male pupils who lack entrepreneurial skills find it harder to solve complex mathematical issues.	C	Male	48	2.76	0.83	Agreed
			Female	60	2.79	0.85	Agreed
8	Males with entrepreneurial talents find it easier to understand mathematical language.	C	Male	48	2.71	0.79	Agreed
			Female	60	3.00	0.88	Agreed
9	Pre-service female teachers contribute less to entrepreneurship education than their male counterparts.	P	Male	48	2.22	0.94	Disagreed
			Female	60	2.14	0.97	Disagreed
10	Positive human interactions are better maintained by male pre-service teachers with entrepreneurial skills.	P	Male	48	2.66	0.86	Agreed
			Female	60	2.81	0.89	Agreed
11	The communication abilities of female pre-service teachers are useless for advertisements.	C	Male	48	2.72	0.95	Agreed
			Female	60	3.01	0.89	Agreed
12	Men are more knowledgeable about ICT in entrepreneurship education than women are.	C	Male	48	2.02	0.96	Disagreed
			Female	60	2.15	0.93	Disagreed
13	The communication abilities of female pre-service teachers are not enhanced by the usage of ICT.	C	Male	48	2.78	0.94	Agreed
			Female	60	2.65	0.96	Agreed



14	Male entrepreneurs who have achieved success in the field of mathematics teaching outperform female pre-service teachers.	L	Male	48	2.71	0.89	Agreed
			Female	60	2.59	0.87	Agreed
15	Entrepreneurial skills are not specifically designed for male pre-service teachers.	L	Male	48	2.64	0.91	Agreed
			Female	60	2.85	0.92	Agreed
16	Female pre-service entrepreneurs are not aided by entrepreneurial education. instructors' output of goods and services	B	Male	48	2.72	0.88	Agreed
			Female	60	2.56	0.83	Agreed
17	More female pre-service teachers than male ones can analyze a business's profits thanks to entrepreneurial education.	B	Male	48	2.68	0.86	Agreed
			Female	60	2.61	0.88	Agreed
18	Male pre-service teachers do not have the opportunity to be accountable in the corporate world through entrepreneurial education.	B	Male	48	2.66	0.90	Agreed
			Female	60	2.71	0.91	Agreed
19	Compared to male pre-service business teachers, entrepreneurial education provides female pupils with a more effective means of calculation skills.	B	Male	48	2.59	0.85	Agreed
			Female	60	2.35	0.88	Disagreed
20	Male pre-service teachers are not encouraged to consider launching a business by entrepreneurial education.	B	Male	48	2.78	0.82	Agreed
			Female	60	2.56	0.83	Agreed

The results in table I shows that item numbers 2, 9 and 12 responses to which revealed that no understanding of entrepreneurial skills that pre-service mathematics teachers gain is unaffected by gender; nopro-service female teachers contribute less to entrepreneurship education than their male counterparts and no men are more knowledgeable about ICT in entrepreneurship education than women are. These results show that all NCE III Mathematics students, regardless of gender, exhibit the necessary competencies.

Research Question 2

The question asked that to what level of entrepreneurial skills in mathematics instruction are pre-service teachers 'knowledge? To deal with this question, responses of the respondents to the questionnaire items which were categorised under levels (items 2, 4, 6, 14 & 15) were summarized. The means and standard deviation in respect of number of students that agreed and those that disagreed with each item was computed. Table II gives the summary of these results.

Table II: Mean and Standard Deviation of Level of Pre-service teachers' skills

SN	Items	Mean	Std. Dev.	Remark
2	The understanding of entrepreneurial skills that pre-service mathematics teachers gain is unaffected by gender.	2.13	0.76	Disagreed
4	Pre-service female teachers exhibit a higher degree of self-awareness in entrepreneurship education than do their male counterparts.	2.98	0.84	Agreed
6	Female pre-service teachers can better understand their strengths and weaknesses with the aid of entrepreneurship education.	2.79	0.79	Agreed
14	Male entrepreneurs who have achieved success in the field of mathematics teaching outperform female pre-service teachers.	2.65	0.92	Agreed
15	Entrepreneurial skills are not specifically designed for male pre-service teachers.	2.74	0.86	Agreed

The results in table II demonstrated that pre-service teachers possess a high degree of entrepreneurial ability in the teaching of mathematics.

Research Question 3

Which of the entrepreneurial skills that pre-service teachers have gained is valuable to them in the teaching of mathematics?

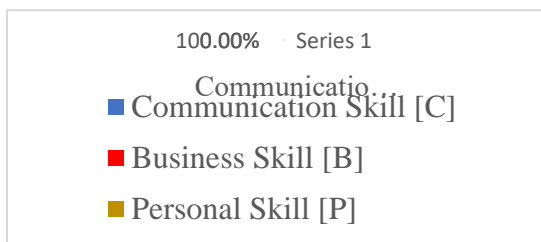


Figure I: challenges of pre-service entrepreneurial skills

The results in bar chart above among the entrepreneurial skills, revealed that business skill is most useful entrepreneurial skill acquired by pre-service teacher in mathematics with 76.85% compare to Personal (P) and Communication (C) skills with 65.18% and 63.12% respectively. These results indicate that NCE III Mathematics students will do better in business regardless of their gender.

Hypothesis

The hypothesis states that there is no significant difference between the challenges of pre-service entrepreneurial skills in mathematics education with respect to their gender. To test the hypothesis, the data on questionnaire was pulled together and subjected to t-test analysis. The result of the t-test is presented in Table III below.

Table III: T-test analysis on the challenges of pre-service entrepreneurial skills in mathematics education with respect to their gender

Gender	N	Mean	Std. Deviation	df	t value	P value	Decision
Male	48	2.73	0.43	106	-0.19	0.48	Not Significant
Female	60	2.81	0.39				

The result in the t-test table shows that there is no significant difference between the challenges of pre-service entrepreneurial skills in mathematics education with respect to their gender. [t=-0.19; p>0.05]. Therefore, H₀₁ is not rejected.

Discussion

The study's findings showed that there are no gender differences in the entrepreneurial skills that NCE III pre-service mathematics teachers have learned. Their levels of learned entrepreneurial knowledge are fundamental for their next endeavours. In addition, the results indicate that pre-service teachers of mathematics education will perform better in

terms of communication and personal skills. Overall, the study found no statistically significant difference between the genders in terms of the knowledge of entrepreneurial skills that pre-service teachers of mathematics education acquire. This implies that gender issues would have no role to play in entrepreneurial skills acquired by pre-service teacher in mathematics education towards his or her future endeavours.

On the contrary, Odumosu and Olusesan (2016) opined that the pre-service teachers concurred that some critical abilities such as those developed in mathematics such as computing ability, problem-solving ability, inventive



ability, analytical ability, decision-making ability, and creativity ability are necessary for success in entrepreneurial endeavours while supporting that effective communication is essential to recording success in entrepreneurship operations. In another view of Agbozo, et. al. (2024) the pre-service teachers believed that mathematics could be used as a tool for social justice because this was something they had learned in prior to attending college.

As a result of the study findings so as to promote equality and social justice in mathematics education, the study highlights the necessity of student collaboration, instructor responsiveness in terms of gender perspective. In order to establish a socially equitable mathematics learning environment and overcoming the challenges for all students, including pre-service teachers, the findings emphasize the significance of addressing entrepreneurial skills in particular to communication, business and personal skills.

Recommendations

Considering the findings of this research study, these are the recommendations which may ameliorate gender issues in entrepreneurial skills of pre-service teacher in mathematics education

- i. In order to assist students attending postsecondary institutions, senior secondary schools in Lagos State and throughout Nigeria are required to teach entrepreneurial subjects.
- ii. A program to raise awareness of gender issues and their implications at all educational levels.
- iii. The existence of an entrepreneurial center in all Lagos State and Nigerian universities, colleges of education, and senior secondary schools.
- iv. The mathematics curriculum should take into account the modern educational framework.
- v. Students with extraordinary talent for entrepreneurship should be encouraged.

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