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Gender Differences in Learned Helplessness and Students' Perceptions of Lecturer's Gender Among University Students in Stem Disciplines in South West, Nigeria

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Abstract
The study examined gender differences in learned helplessness and students' perceptions of lecturer's gender among university students in STEM disciplines in South West, Nigeria. The study was conducted using quantitative method, that is, the use of questionnaires to collect data. The Learned Helplessness Scale was administered to participants. The participants were selected using purposive sampling and consisted of 400 undergraduates from two private universities and two public universities in South West Nigeria. Independent sample t test and Linear Regression were used to analyze the data. The result of this study indicated that there was a significant difference between male and female students on learned helplessness. There was also a significant difference between male and female on preference for male and female lectures in STEM disciplines. However, no significant prediction was found between learned helplessness and students' perceptions about gender in STEM disciplines. Implications for researchers and further research are discussed.
Keywords: Gender, learned helplessness, student, perceptions, STEM disciplines.

1. Introduction

The last three decades have seen increasing efforts to increase the presence of women into STEM fields. While the number of women in science and engineering is growing, men still outnumber women, especially at the upper levels of these professions (Beede, Julian, Langdon, Mckittrick, Khan, & Dams, 2009; Diekman & Co, 2010; Appianing & Van-Eck, 2015). STEM is an acronym for Science, Technology, Engineering and Mathematics. This comprises the natural and agricultural sciences; computer and information sciences; engineering; and mathematics (Martine, 2016; Hill, Corbett, & St. Rose, 2010; Laird, Alt, & Wu, 2009; Nord, Roey, & Perkins et al. 2011). This is a field that is largely associated with the males. Rosser (1986); Middlecamp & Nickel (2000) argues that the science classroom is gendered and the masculine nature of science classes contributes to the lack of women in science. Male lecturers are the "norm" in the academics, particularly in the STEM fields (Bassow, 1994); this point is further buttressed by Graham (1997), when he states that male dominated professions are the STEM related professions because most people associate the sciences with males and humanities – because they excel in mathematically demanding subjects - and arts with the females – because they excel in subjects using language skills (Hill et al. 2010).

The gender disparity in STEM may be attributed to teaching styles or skills and experiences at school which result in more accessibility of science to boys than to girls (Schiebinger, 2010). Valian (2007), and Mangan (2012) suggest that fewer females than males pursue professional careers in STEM due to low interest owing to lack of early exposure and non- encouragement. Girls generally don't get to experience the level of exposure or encouragement in STEM fields that their male counterparts do. Boys are exposed early to science sets as toys, and even helping out their fathers out in fixing little electrical faults around the home which helps to spark an interest in these subjects. And boys are often pushed in school to take the more challenging math and science classes. Gender stereotypes contribute to gender disparity in STEM fields (Kiefer & Sekaquaptewa, 2007b; Nosek *et al.,* 2002; Nosek & Smyth, 2011); affecting student performance (Spencer, Steele, & Quinn, 1999; Walton & Cohen, 2003) and expectations of success and valuing of STEM between the genders (Eccles, 2007; Appianing & Van-Eck, 2015).

The first objective of this study examines gender differences in learned helplessness and in the STEM disciplines in selected universities in South – West Nigeria. Stereotypical beliefs that males are better suited to STEM disciplines than females remains, especially in African societies. Some research have shown that differences in male and female performance on STEM-related assessments have narrowed or even closed significantly, (Lindberg, Hyde, Petersen, & Linn, 2010), other research continue to report gender differences in student interest and motivation toward mathematics and science, as well as differences in student performance in mathematics and science (Ceci, Ginther, Kahn, & Williams, 2014; White House Council on Women and Girls 2011). A large number of these researches were conducted in western societies, there is a paucity of research in these fields in Nigeria, and so this research will contribute to data in this field. The underrepresentation of women in STEM fields, especially in computer and engineering science, has been attributed to attitude rather than aptitude (Else-Quest, Mineo & Higgins, 2013; Appianing & Van-Eck, 2015). Self-efficacy theories have been used in accounting for observed gender differences. Learned helplessness has clear implications for student

academic behaviour by undermining a student's actual ability in the classroom. This works through the factors of motivation and belief in self-intelligence. As students consistently perceive that there is nothing they can do to control their outcome, they make less and less of an attempt to do so. A student who does poorly on several science tests might quickly begin thinking, "This is too hard," "I'm no good at science," or "I don't like this subject anyway." The consequence of feelings of low self-efficacy may be a sense of learned helplessness and the feelings of helplessness may lead to passivity and failure for the student (Wilson, 2007; Dweck, 2008). Nolen-Hoeksema, Seligman, & Girgus, (1986), attribution model states that individuals who typically describe bad events as internal, stable, and global will be more likely to experience symptoms of helplessness than individuals who depict events as external, unstable, and having specific causes.

Result of several research show differences in the attribution patterns in boys and girls, such that while girls tend to give more emphasis to effort when explaining their performance (Lightbody, Siann, Stocks & Walsh, 1996; Georgiou, 1999), boys appeal more to ability and luck as causes of their academic achievement (Burgner & Hewstone, 1993). In other research, girls make external attributions for successes and failures, and when they make internal attributions, these refer not so much to effort, but to ability (Postigo, Perez & Sanz, 1999). However, boys usually attribute successes to stable internal causes such as ability, while failure is attributed to unstable external causes like luck or internal causes like effort, thus showing an attribution pattern which enables them to enhance their own image of themselves (Smith, Sinclair & Chapman, 2002). In another study by Rusillo and Arias (2004), on gender differences in academic motivation, they found that male students show more external attribution patterns when faced with failure, while female students show more internal attribution patterns; taking responsibility for poor academic results, attributing them to their lack of personal effort or ability.

The second objective of this study was to examine gender differences in student's preference of lecturer's gender. Gender stereotypes may also have an influence on student preference for lecturer's gender, as different research has shown that male and female students have different expectations of male and female lecturers. Bennett (1982) in a survey found that students did not have different standards of reference for male and female instructors but women were perceived to be less authoritarian and more charismatic. In a study by Boring (2017), she found that the different teaching dimensions that students value in male and female professors tend to match gender stereotypes. Male teachers were perceived as being more knowledgeable and having stronger class leadership skills by both male and female students despite the fact that students appear to learn as much from women as from men. In another research by Kardia, Simpkins, Lun & August (2001), male instructors were significantly more likely to be viewed as intelligent while female instructors needed to prove their intelligence, and problematic teaching behaviours were significantly more likely to be excused in male instructors than in female instructors (Sinclair & Kunda, 2000). Basow and Silberg's (1987) research revealed that male students gave female professors significantly poorer rating than male professors and female students also evaluated female professors less favourably than male professors based on their evaluations of their teaching effectiveness and sex-typed characteristics. The same results were found in another study by Fandt and Stevens (1991).Contrary to previous results, based on videotaped lectures, Winocur andSirowatka (1989) revealed that students' perceptions of lecturers are dependent largely on lecturing style than the gender of the lecturers. In another research by Morales, Avilla, and Espinosa (2015), qualitative assessment of science and mathematics classrooms showed most students prefer female teachers to teach science and mathematics subjects because they show deep compassion and exhibit motherly love which contribute to better learning for them.

2. Research Method

2.1 Participants

Participants were recruited from two private universities and two public universities in South Western part of Nigeria. A total of four hundred students from the four universities participated in this study. These students were selected from all levels, that is from 100 to 500 level. The age ranges of the students are between 16 -30 years. The mean age of participants was 21.66. This sample size was chosen from the Colleges or Faculties of Science, Engineering and Technology from the four Universities and at different levels. 100 questionnaires were administered to each university which sums it up to a total of 400 questionnaires. The study adopted a purposive sampling technique.

2.2 Research design

This research adopted a survey research design with the use of questionnaire, which was used to measure gender differences in learned helplessness sand students' perceptions of lecturer's gender among university students in STEM disciplines in South West, Nigeria. The independent variable was gender while the dependent variables were learned helplessness and students' perceptions of lecturer's gender in STEM related disciplines.

2.3 Research Instrument

The questionnaire was divided into three sections. The first consist of the socio-demographic background of the respondents. Section two measures learned helplessness; the instrument used was the Learned Helplessness Scale developed by Quinless and Nelson (1988). It is a standardized scale with an alpha reliability of 0.85.

Section three measured students' perceptions of lecturer's gender. . Questions in this section were modified by the researchers from a questionnaire on gender bias by Wilson and Taylor (2001).

2.4 Method of Data Analysis

The techniques used in analyzing these data were inferential and descriptive statistics using the Statistical Package for Social Sciences (SSPS 20). For the descriptive statistics, the mean for age and the frequency for gender, family type and name of school were used to summarize the participant's scores. For inferential statistics, Independent t-test and linear regression were used where applicable in order to test the hypotheses of the study. The difference between the mean scores was analyzed using the independent t-test, while linear regression was used to test if a variable would predict another variable.

3. Results

Table 3.1: Gender distribution of the respondents

S/N	Gender	Frequency (n)	Percentage (%)
1	Male	205	51.2
2	Female	195	48.8
3	Total	400	100

The table 3.1 above shows that most of the participants are male 205(51.2%).

Table 3.2: Students' perceptions of female lecturers in STEM disciplines

My university is a comfortable environment for women in the classroom		
Response	Frequency (n)	Percentage (%)
Agree	377	94.3
Disagree	23	5.7
Women lecturers must prove their competence to students more than male lecturers.		
Agree	326	81.5
Disagree	74	18.5
Students at my university challenge female lecturers more aggressively than they do male lecturers.		
Agree	322	80.5
Disagree	78	19.5
Female lecturers call on female students more often than male students		
Agree	207	51.75
Disagree	193	48.25
During class, students have made gender insensitive remarks intended for the class to hear.		
Agree	359	89.75
Disagree	41	10.25

Table 3.2 indicates that most of the participants agree that students' perceptions toward female lecturers in STEM discipline tend to be negative as compared to their perceptions to the male lecturers in the same disciplines.

Table 3.3: Descriptive statistics for learned helplessness

Range	Mean	Median	Interquartile	Minimum	Maximum
67.00	55.93	55.00	8.00	24.00	91.00
Male					
Range	Mean	Median	Interquartile	Minimum	Maximum
57.00	52.75	53.00	4.00	24.00	91.00
Female					
Range	Mean	Median	Interquartile	Minimum	Maximum
55.00	59.32	58.50	10.00	31	86

Table 3.3 indicates the descriptive statistics for learned helplessness and for gender as it relates to learned helplessness. The mean for learned helplessness is 55.93; for male is 52.75 and female is 59.32.

Hypothesis 1: There will be a significant gender difference on the level of learned helplessness of university students in STEM disciplines

Table 3.4: Independent t-test of gender differences on learned helpless

Gender	N	Mean	S.D	df	t	*P*
Male	201	52.75	7.12	387	-8.46	<0.05
Female	188	59.32	8.16			

Table 3.4 shows the t-test analysis of gender differences on the learned helplessness of University students in South West Nigeria and the results depict that there is a significant difference between male and female on

learned helplessness (t= -8.46, df = 387, P <0.05). That is, female students had higher prevalence of learned helplessness than the male students.

Hypothesis 2: Learned helplessness as determinant of students' perception of gender in STEM discipline

Table 3.5: Learned helplessness as predictor of students' perception of gender in STEM disciplines

Predictor	**B**	**R**	**R-Square**	***F***	***P***
Learned helplessness	-0.06	0.09	0.01	3.28	> 0.05

Dependent Variable: Perception of lecturers in STEM disciplines

Results in Table 3.5 indicates that learned helplessness does not significantly predict students' perceptions of gender in STEM discipline (R=.09; R^2=.01; P < 0.05). This means that learned helplessness does not determine students' perceptions of gender in STEM discipline. However, learned helplessness accounts for 1% of the variance in the level of students' perceptions toward STEM disciplines.

Hypothesis 3: There is a significant gender difference on preference for male and female lecturers in STEM disciplines

Table 3.6: Independent t-test of gender difference on preference for male and female lecturers in STEM disciplines

Gender	N	Mean	S.D	df	t	*P*
Male	205	2.45	0.83	398	-2.85	<0.05
Female	195	2.71	0.94			

Table 3.6 shows the t-test analysis of gender difference on preference for male and female lecturers in STEM disciplines and it is indicated that there is a significant difference between male and female on preference for male and female lecturers in STEM disciplines(t= -2.85, df = 398, P <0.05). That is, female students show significantly higher preference for male and female lecturers compared to male counterparts.

Hypothesis 4: There will be a significant gender differences on students' perceptions of female lecturers in STEM disciplines

Table 3.7: Independent t-test of gender differences on students' perceptions of female lecturers

Gender	N	Mean	S.D	df	t	*P*
Male	205	12.60	3.94	398	2.29	<0.05
Female	195	11.70	3.83			

Table 3.7 shows the t-test analysis of gender differences on students' perceptions of female lecturers in STEM disciplines and the results depict that there is a significant difference between male and female on their perceptions of female lecturers in STEM Disciplines. (t= 2.29, df = 398, P <0.05).

DISCUSSION OF FINDINGS

The result of the first hypothesis showed a significant difference between male and female on learned helplessness among university students in South West Nigeria. This result shows a consistency with other research. For example, in the work of Postigo, Perez and Sanz, (1999), they found that girls make external attributions for successes and failures, and when they make internal attributions, these refer not so much to effort, but to ability. However, boys usually attribute successes to stable internal causes such as ability, while failure is attributed to unstable external causes like luck or internal causes like effort, thus showing an attribution pattern which enables them to enhance their own image of themselves (Smith, Sinclair & Chapman, 2002). In another study by Rusillo and Arias (2004), on gender differences in academic motivation as it relates to learned helplessness, they found that male students show more external attribution patterns when faced with failure, while female students show more internal attribution patterns; taking responsibility for poor academic results, attributing them to their lack of personal effort or ability. These findings may be considered logical due to the egoistic nature of males who would not want to admit failure to internal characteristics but would rather attribute it to external cause.

The second hypothesis stated that learned helplessness would predict students' perception of gender in STEM discipline, but the findings shows that learned helplessness is not a determinant of students' perception of gender in STEM discipline. However, this is contrary to a previous study which found that learned helplessness can predict the way students perceive gender in STEM disciplines. Students consistently perceive that there is nothing they can do to control their outcome, they make less and less of an attempt to do so. A student who does poorly on several science tests might quickly begin thinking, "This is too hard," "I'm no good at science," "females are underrepresented in STEM disciplines" or "I don't like this subject anyway." The consequence of feelings of low self-efficacy may be a sense of learned helplessness and the feelings of helplessness may lead to passivity and failure for the student (Wilson, 2007; Dweck, 2008; Appianing & Van-Eck, 2015).

The third hypothesis states that there is a significant gender difference on preference for male and female

lecturers in STEM disciplines. The result indicates that there is a significant gender difference on preference for male and female lecturers in STEM disciplines. This may be due to gender stereotypes as it relates to STEM disciplines. Most people grew up to believe that certain professions are meant for men, while others are meant for women. For example, Valian, (2007) and Mangan, (2012) suggest that fewer females than males pursue professional careers in STEM due to low interest owing to lack of early exposure and non- encouragement. Girls generally don't get to experience the level of exposure or encouragement in STEM fields that their male counterparts do. Boys are exposed early to science sets as toys, and even helping out their fathers out in fixing little electrical faults around the home which helps to spark an interest in these subjects. And boys are often pushed in school to take the more challenging math and science classes. However, another study found female lecturers to be preferred in STEM disciplines more than their male counterparts. A qualitative assessment of science and mathematics classrooms showed most students prefer female teachers to teach science and mathematics subjects because they show deep compassion and exhibit motherly love which contribute to better learning for them (Morales, Avilla, & Espinosa, 2015). This is also evident in table 3 and 8 in the results section, where it is evident that there is a difference in the way male perceives female lecturers in STEM disciplines and the way female perceive them.

The final hypothesis which states that there will be a significant gender difference on students' perceptions of female lecturers in STEM disciplines was found to be significant. That is, there is a difference between male and female perceptions of female lecturers in STEM disciplines. This finding is supported in the work of Kardia, Simpkins, Lun and August (2001). They found that male instructors were significantly more likely to be viewed as intelligent, while female instructors needed to prove their intelligence, and problematic teaching behaviours were significantly more likely to be excused in male instructors than in female instructors (Sinclair & Kunda, 2000). Contrary to this finding, Winocur and Sirowatka (1989) revealed that students' perceptions of lecturers are dependent largely on lecturing style than the gender of the lecturers. In another research by Morales, Avilla, and Espinosa (2015), qualitative assessment of science and mathematics classrooms showed most students prefer female teachers to teach science and mathematics subjects because they show deep compassion and exhibit motherly love which contribute to better learning for them.

A limitation to this current study is non-coverage of a larger sample of students in South West Nigeria, in order to enable a better generalization of the findings. Future research conducted on this subject should involve larger sample or participants from each state in South West. Also, a more recent version of the research instrument on learned helplessness should be used so as to cover questions applicable to current realties.

In conclusion, there is a gender difference between male and female students in STEM disciplines on learned helplessness. Also, a significant difference was found between male and female on students' preference of male and female lecturers in STEM disciplines. However, learned helplessness did not significantly predict or determine students' perceptions of gender in STEM disciplines.

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