

## **EXAMINING GENDER DIFFERENCES IN LEARNING STYLES AND INSTRUCTIONAL STRATEGIES IN IMO STATE'S TERTIARY TECHNOLOGY EDUCATION**

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**Abstract:** The study was carried out to ascertain the gender based instructional preferences and learning styles in technology education in Imo State Tertiary Institutions. Two research questions and two null hypotheses were raised and formulated respectively to guide the study. The study adopted descriptive survey research design. The population consisted of 50 students in technology education department in Alvan Ikoku Federal College of Education Owerri, Imo State. The population is manageable, hence no sampling. A structured questionnaire was used as instrument for data collection for the study. Three experts validated the instrument. The reliability of the instrument was established using Cronbach alpha method at coefficient of 0.80. Data related to the research questions were analyzed using mean and standard deviation while hypotheses were tested using t-test. The findings of the study revealed that males prefer learning activities involving practical and logistics while females preferred learning activities involving verbal and visual. The study therefore recommended that teachers should employ auditory and visual learning styles while teaching predominantly female students' classes; teachers should make use of kinesthetic learning styles while teaching predominantly male students' classes and teachers should employ face to face lecturing, self-directed reading, experimental learning and group discussion when teaching both male and female students.

**Keywords:** Gender, Instructional Preferences, Learning Styles, Technology Education

### **Introduction**

Education is a learning process whereby an individual (male or female) acquire positive change in behaviour, geared towards contributing positive development to the individual and the society. It is a necessary weapon that can be used to surmount ignorance, poverty and disease, and to produce functional citizens with positive attitudes towards loving what they ought to love and hating what they ought to hate (Enaibe and Imonivwerha, 2017). One aspects of education that have improved economic status of many nations is technology education.

The Federal Republic of Nigeria (FRN, 2014) in the National Policy on Education (NPE) defines Technology Education (TE) as the aspect of education which leads to the acquisition of practical skills as well as basic

scientific knowledge. From national goals as stated in the NPE, it can be seen that the Federal Government attached much value to TE.

The UNESCO (1978) defines TE as a comprehensive term referring to the educational process when it involves, in addition to general education, the study of technologies and related sciences and the acquisition of practical skill and knowledge relating to occupations in various sectors of economic and social life. In line with the UNESCO definition of TE, the NPE stated that TE remains as an instrument for promoting environmentally sound and sustainable development and method of alleviating poverty (FRN, 2014).

TE provides employable skills to reduce poverty, help to apply acquired knowledge and skills for scientific and technological development and advancement of the nation (Ijebu, 2016). VTE is the best way for fighting poverty (Nwakanma, 2014). Smith (2015) states that TE in its broad sense refers to the training that enable one to carry on successfully a socially useful occupation. Impliedly TE provides trained manpower in applied science, industrial, agriculture, business and home making among others.

The TE programmes offer arrays of skills needed for gainful employment in various fields of human endeavors. These skills which are sometimes manipulative in nature make one more employable in one sector of the economy or the other. Okon (2009) in Nwakanma (2015) stated that those in Business education could acquire managerial skills, information communication technology skill, human relation skill, job survival skill and accounting skills. Adeola (2018) observed that those in Home Economics education can acquire effective skills in food and nutrition, home management, textile and clothing, family and child care and hospitality. Alio (2021) stated that those in technical education could obtain skills in design, construction, operation, maintenance and trouble-shooting while in Agricultural education, it provides individuals with skills in crop production, animal husbandry, pest control, weed management, and disease control and management. These skills acquired through TE prepare and open large range of doors of either paid or self-employment opportunities and over 1,200 careers in different sectors of the economy (Nwakanma, 2015).

TE is also intended to provide the skills and manpower for industrial and other engineering services required by the society for sustainable development. Manpower on the hand according to Okolie (2014) could be seen as the total supply of persons available and fitted for service. TE is a process of getting people regardless of their gender ready and keeping them ready for the types of services we need (Olaitan, 2015).

Gender is the socio-cultural dimension of being female or male. This issue of gender has been and remained a controversial issue that has generated a lot of debate in the society. Most of the assumption is that both male and female who though are naturally created differently, brought up under different environments to complement each other must be treated and behave the same way. (Uwaifo, 2021). This assumption does not seem to be convincing as there are so many differential characteristics and qualities that emanate from the individual's natural formation or the environmental factors that need to be carefully considered or recognized.

Horny (2010) defines gender as the fact of being male or female especially when considered with reference to social and cultural differences. The issue of gender education has often been looked at from the perspective of quality in accessibility, that is to say equal opportunity should be given to learners irrespective of sex and learning styles/instructional preferences.

There exist a number of learning styles, each individual or student being unique have preferable style of learning and less use of other styles (Sulariman 2013). The students need to be guided on how to benefit from their learning styles and develop their less dominant abilities. Adapting of teaching approaches that meet the student difference learning styles/preference may improve student motivation and performance. Learning the student style preferences will aid in the development of the most effective teaching approaches.as evident in Gardener's Model of Learning Styles /Instructional Preferences.

Garden's model comprises of visual (v), Auditory (A), reading-writing (R) and kinesthetic (K) collectively known as VARK".

Students of visual type learn best information mainly when they see and read the information, they prefer the information to be in form of text, symbols, charts, diagrams and pictures. The learning strategies that suit these students include writing own notes, taking notes, making graphs or diagrams or mid maps, having vivid imagination, watching video or TV diagrams. Reading illustrated books or magazines, using bright colors to highlight notes, studying in a quiet place and visualizing information as a picture.

Auditory students learn effectively when they hear information or talk about it. They prefer verbal presentations, discussions and cooperative learning. The learning strategies for these set of students involve participating in class discussion, making presentation, recording lectures, reading text out aloud, talking out aloud repeatedly, making up little strong or thyme, using mnemonic discussion topics with peers/instructors, teaching peers and listening to audio recording.

The third leaning style is reading-writing. Students of this type of learning style prefer to lean by reading and writing. They often benefit from interactions with textual materials. The learning strategies advisable for them include making flash cards or words or concept, writing out important information, reading notes silently, organizing diagrams into statement and rewriting information in other words.

For kinesthetic students, they learn great through hands-on approach. Actively touching or doing to explore the information. This kind of student likes activity based practical and investigate hearing. The hearing strategies suitable for them are taking frequent study, practicing skills, reading aloud from notes, carrying out experiments or role plays, demonstrating to other people, highlighting reading materials, listening to music when they study and skimming through reading materials.

Meanwhile, variety in content presentation and instructional materials allow students to learn better and more quickly especially when the one used matched their preferred learning styles. Biggs (2013) and Ramsden (2023) were of the opinion that developing and understanding of students is the most important activity lecturers can engage in to assist learners to meet educational objectives in higher education. Learners should understand the students in terms of their preferences, approaches to learning, responses and teaching arrangement (assessment). Male experimentally show strengths in logical mathematical, visual spatial and bodily kinesthetic while female

demonstrate strengths in verbal-linguistic and musical rhythmic (Martins, 2019). This study further indicated that males are significantly strong in logical and mathematical thinking. Again, Rammsted (2020) reported that male had significantly strong in musical- rhythmic knowledge. It is important to consider student learning styles so that teachers can cultivate self-monitoring and self-awareness for learning and motivation among students. It will also equip teachers to recognize, acknowledge and accommodate student differences and learning styles.

### **Statement of the Problem**

Technology education plays a vital role in the economic development of any nation. It is on this premises that most developing and developed countries of the world pay keen attention to the teaching and learning of technology education related subjects at different levels of education and more especially at the tertiary level. The disparity among male and female students in this area of study in terms of their academic performance and achievement could be attributed to instructional preferences and learning styles; hence the study.

### **Purpose of the Study**

The purpose of the study was to determine gender-based instructional preferences and learning styles for technology education students in tertiary institutions in Imo State. Specifically, the study sought to:

1. examine gender differences in learning styles in technology education in tertiary institutions.
2. examine gender differences in the technology education instructional preferences in technology education in tertiary institutions

### **Research Questions**

The following research questions guided the study.

- 1 What are the gender differences in learning styles in technology education in tertiary institutions in Imo State?
- 2 What are the gender differences in the technology education instructional preferences in technology education in tertiary institutions in Imo State?

### **Hypotheses**

The following null hypotheses were tested at 0.05 level of significance.

1. There is no significant difference between the mean ratings of male and female students on their learning styles in technology education in tertiary institutions in Imo State.
2. There is no significant difference between the mean ratings of male and female students on their instructional preferences in technology education in tertiary institutions in Imo State

### **Method**

The study adopted descriptive survey research design. The population of the study comprises of all the students in technology education in Alvan Ikoku Federal College of Education Owerri. This is the only school that offers technology education in Imo State tertiary institutions. The entire population of 50 students were used for the study This instrument for data collection was a structured questionnaire titled “Gender based instructional preferences and learning styles in technology Education in Imo State Tertiary Institutions (GBPLS)”. A questionnaire was formulated based on 4-point Likert type scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) with corresponding ordinal value of 4, 3, 2 and



1 respectively. Thirty (30) copies of the questionnaire were pilot tested at Enugu State University of Science and Technology (ESUT) on 30 students not included in the sample for the study to determine the reliability of the instrument. Responses obtained from the administered instrument was correlated using Cronbach Alpha. The result of the correlation (R) was 0.80; showing that the instrument was reliable. Copies of the questionnaire was administered to and retrieved from the students through the help of research assistant. The data were analyzed using mean and standard deviation for answering the research questions. A mean value of 2.50 and above indicated respondents' agreement with an item while a mean of 2.49 and below indicated respondents' disagreement with an item. The decision rule drawn for the null hypotheses states that the null hypotheses is not rejected, if t-calculated value is less than t-critical value, otherwise it is rejected.

Results

Research Question 1

What is the gender difference in learning styles?

Table 1

Mean and standard deviation of student's responses on learning styles by gender S/N ITEMS

	FEMALE	MALE			X <sub>2</sub>	SD <sub>2</sub>	Decision
		X <sub>1</sub>	SD <sub>1</sub>	Decision			
1. Female students prefer Visual learning styles than Male	4.16	1.41	A	3.55	0.70	A	
2. Reading and writing is Generally accepted Learning styles for both Males and females	2.39	1.31	D	2.30	1.30	D	
3. Males prefer kinaesthetic Method of learning than Females		3.58	1.48	A	3.50	1.50	A
4. Auditory learning styles is For males only		2.30	1.30	D	2.25	1.25	D
5. Females like auditory Learning styles than males	3.56	1.45	A	3.50	1.52	A	
<b>Grand Total</b>		<b>3.20</b>	<b>1.39</b>		<b>3.02</b>	<b>1.24</b>	

Data in Table 1 revealed that both male and female students agree that female students prefer visual learning styles and auditory learning style than male students as male students prefer kinaesthetic method of learning than



female. The table also shows that both disagree that reading and writing is generally accepted learning styles for both and auditory learning styles is for males only.

**Research Question 2**

What is the gender differences in the technology education instructional preferences?

**Table 2. Mean and standard deviation of the student responses on instructional preferences.**

S/N	ITEMS	FEMALE			MALE		
		X <sub>1</sub>	SD <sub>1</sub>	Decision	X <sub>2</sub>	SD <sub>2</sub>	Decision
1.	Face to face lecturing	3.10	0.83	A	3.00	0.50	A
2.	Online exercise	2.37	0.80	D	3.16	0.62	A
		3.22	0.83	A	3.04	0.61	A
		3.12	0.33	A			
5.	Discussing in groups	2.75	0.82	A	3.04	0.61	A
	Outside class						
6.	Discussing in groups in	2.82	0.89	A	2.92	0.91	A
	class						
	<b>Ground Total</b>	<b>2.88</b>	<b>0.80</b>		<b>3.05</b>	<b>0.94</b>	

Data in Table 2 indicated that both male and female students agree with face-to-face lecturing, self-directed reading, experimented learning, discussing in groups outside class and discussing in groups in class as instructional preferences. Also, while male students agree that online exercise is an instructional preference the female students disagree.

**Hypothesis 1:** There is no significant difference between the mean ratings of male and female students on learning styles.

Table 3 t-test analysis of difference between the mean ratings of female and male students on learning styles.

Gender	N	X	SD	DF	Standard	t-cal	t-crit	Decision	Error
Female	18	3.20	1.39	48	0.12	0.537	1.671	Accepted	
Male	32	3.02	1.20						

Analysis on table 3 reveals that the t-cal (0.537) is less than it t-crit (1.671). This implies that there is no significant difference between the mean ratings of male and female students on learning styles. Hence, the hypothesis is accepted.



**Hypothesis 2.** There is no significant difference between the mean ratings of female and male students on instructional preferences.

**Table 4. t-test analysis of difference between the mean ratings of female and male students on instructional preferences.**

Gender	N	X	SD	DF	Standard Error	t-cal	t-crit	Decision
Female	18	2.8	5.0	8.0	480.278	0.612	1.671	Accepted
Male	32	3.05	0.94					

Analysis on table 4 indicates that the t-cal (0.612) is less than t-crit (1.671). This means that there is no significant difference between the mean ratings of female and male students on instructional preferences. Therefore, the hypothesis is accepted.

**Discussion**

The findings of the study revealed that both male and female students agree that female students prefer visual learning styles and auditory learning style than male students as male students prefer kinaesthetic method of learning than female. The findings also shows that both disagree that reading and writing is generally accepted learning styles for both and auditory learning styles is for males only. This is in agreement with Gang (2017) who stated that both male and female student prefer auditory learning style. The findings of the study are also in consonant with James (2018) who posited that male students prefer reading than writing unlike their female counterparts. However, the findings of the study are in disagreement with that of Kingsley (2018) who noted that both male and female students prefer visual learning styles and auditory learning style as those two styles concretizes learning. The findings of the study shows that that there is no significant difference between the mean ratings of male and female students on learning styles.

The findings of the study also indicated that both male and female students agree with face-to-face lecturing, self-directed reading, experimented learning, discussing in groups outside class and discussing in groups in class as instructional preferences. Also, while male students agree that online exercise is an instructional preference, the female students disagree. This finding is in line with that of Shade (2016), who stated that face to face classroom interaction enhances learning among students irrespective of their gender or sex. The same is true with the findings of Hanson (2019) that revealed that self-directed reading, experimented learning, discussing in groups outside class and discussing in groups in class as instructional preferences for male and female students. However, the findings of the study are not in agreement with that of Rose (2019) who observed that female students in recent times prefer online teaching and learning exercise. The findings of the study also indicates that there is no significant difference between the mean ratings of female and male students on instructional preferences.

## **Conclusion**

Based on the findings of the study, it is evident that males prefer learning activities involving practical and logistics while females preferred learning activities involving verbal and visual. Nevertheless, all students regardless of their gender use different learning strategies to improve their learning. Most students regardless of their gender prefer to either discuss the topic with peers/lecturers or join a study group to undertake the new information. It is evident that the students love to interact with other people (affective strategies) and evaluate one's learning (meta-Cognitive strategies).

## **Recommendations**

On the basis of the findings and conclusion reached, the following recommendations were made.

1. Teachers should employ auditory and visual learning styles while teaching predominantly female students' classes.
2. Teachers should make use of kinesthetic learning styles while teaching predominantly male students' classes.
3. Teachers should employ face to face lecturing, self-directed reading, experimental learning and group discussion when teaching both male and female students

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