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Students' Perceptions of the Image of a Scientist in Enhancement of Achievement to Science

Dr Odi-Owei Vivian Abiodun, PhD[1], Dr Cleopas Blessing Chinyere, PhD[2], Prof. Igbojinwaekwu Patrick Chukwuemeka, PhD[3]*

[1]Department of Science Education, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria

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***Corresponding author:** Prof. Igbojinwaekwu Patrick Chukwuemeka
Department of Science Education, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria

Abstract

This study, students' perceptions of the image of a scientist in the enhancement of achievement in senior school Biology, was carried out using survey research design in Ogbia and Yenagoa Local Government Areas of Bayelsa State. Four research questions and three null hypotheses were posted. The population of the study was 12,315 Senior School Three Biology students. The sample of the study was 2,400 Senior School Three Biology Students. A purposive sampling technique was used to obtain the sample of the study. Two validated and reliable instruments, Perception of the Image of a Scientist Task and Students' School Promotion Examination Results Sheet, were used to collect data for this study. Data were analyzed using mean, standard deviation, frequency and z-test. The results were that more Senior School Three Biology Students perceived that a scientist is a male than those who perceived a scientist as a female. The female students who perceived that a scientist is a male were more than their female counterparts who perceived that scientist is a female. The researcher recommended, among others, that more female students should be encouraged to study science, including Biology and related courses to disabuse the perception that more males than females are scientists; science teachers should teach the students history and contributions of scientists to concepts in science and development of the society.

Keyword: Academic Achievement, Image, Perception, Scientist.

INTRODUCTION

Science is a universal subject that covers the branch of knowledge that examines the structure and behavior of the physical and natural world through observation and experiment. It is also an intellectual, practical activity and encompassing systematic study of the structure and behavior of the physical and natural world [1]. According to [2], the word science comes from Latin word "scientia" meaning "knowledge" and in the broadest sense it is any systematic knowledge-base or prescriptive practice capable of resulting in prediction. Science can also be understood as a highly skilled technique or practice.

Science education plays an important role in developing secondary students for active engagement in the modern world, equipping them with the essential skills such as critical skill, problem solving, scientific literacy, among others. According to [3], scientific literacy and critical thinking are key components of science education, aiming to prepare students to think and to function as responsible citizens in a world increasingly affected by science and technology. Similarly, the Nature of Science is essential to developing scientifically literate students [4]. The scientific method is a cornerstone of secondary school science education. Students are introduced to this systematic approach used by scientists to investigate and solve problems. They learn to formulate hypotheses, design experiments, collect data, and draw conclusions based on evidence. This process fosters logical reasoning and nurtures their ability to approach problems analytically.

The [5] emphasizes that science be taught in schools in such a way that it will have meaning and relevance to the needs of the students and society. Therefore, students should be given opportunities in their science classes to be engaged in learning experiences that promote their scientific literacy, critical thinking skills and also their perception of scientists. [6] state that students must not only learn to understand the concept of science but use the same knowledge to develop the ability to think and understand what is happening around them. Scientists are people that have gone through

training in science disciplines at any approved university. According to [7], a scientist is a person who has been, professionally, trained in an approved institute in science programmes like Biology, chemistry and physics. Scientists use logical reasoning and critical thinking to formulate hypotheses, test them through experiments (empirical evidence) and draw conclusions [2]. The textbooks are veritable materials to showcase who the scientist is to the students in teaching-learning process. Textbook resources are vital tool in the custody of science teachers, as implementer of the curriculum to achieve educational goals [8;9]. This is one of the avenues teachers use to explain nature of science, scientific methods, science skills, processes, scientist, among others and it shapes students' perceptions of the image of the scientist [9]. The Nature of Science and the image of the scientist move together as the former cannot be understood without the later. Understanding the image of the scientist is crucial to meaningful learning, deep learning and relatability of concepts which impact on students' attitude, academic performance and the whole of the students. Studies revealed that students have inconclusive perception of the image of the scientist and many of the textbooks have it traditional and stereotyped, white figures, dark figures, clothe with different attire, among others [10]. [11] reviewed relevant and historic literature which includes Draw A Scientist Test (DAST) designed by Chambers in [11] and Newton and Newton in [11],"4-11 year olds' perception of the scientist using the DAST and qualities of a scientist which includes unkempt hair, glasses, scruffy beard, white laboratory coat, symbols of knowledge, symbols of research, technology tools and titles such as, I have found it, in the work of". They chambers and Newton and Newton. They opine that conception of science start developing at pre-school years (Newton and Newton in [11]. Scarcely did teachers explain or talk about the scientist during science classes, as it is intentionally or unintentionally omitted during science classes [10]. This may be because of limited time, lack of preparation, work overload, overloaded scheme of work, difficult to teach, among others. Imagine the teacher talking about the history of Gregor Mendel during genetics lesson, Michael Faraday during electromagnetism lesson, Albert Einstein during mass and energy lesson, John Dalton during atomic model, Charles Darwin during evolution lesson and the brain behind the lesson before the main content, teaching and learning become more fun, engaging and connecting to prior knowledge and shaping better perception of the students about the scientist. More so, it arouses interest, enhances knowledgeability of the scientist, sustains interest, improves engagement, understanding, relatability to the environment and enhances academic achievement in science. Invariably, students with poor perception of image of a scientist may be less inclined to consider scientific careers, limiting their potential to pursue further studies in Biology related fields. As a result, it is crucial to address misconceptions and biases related to scientists' image. This will help to promote a positive learning experience and support students to achieve their full potential in Senior School Biology. The understanding of the scientist behind the science lessons, Biology in particular, will shape a better image in the students and this perhaps will enhance acquisition of science skills, enrolment into science courses increasing STEM population and scientific and technological advancement. [12] show that there is need to prevent positive perception of science and scientists from 'dying out' in future generations. Therefore, it is imperative to apply STEM-based learning in science education, so science students can cultivate meaningfulness in learning and hence, empower higher thinking skills [13].

Student's perception of the image of scientists can, significantly, influence the attitudes and achievements in science [10]. The image of scientists is often influenced by historical stereotypes and representations in popular culture. Traditional portrayals often depict scientists as predominantly male, eccentric and socially isolated individuals engrossed in their works [11]. Such perceptions create an unrealistic view of what it means to be a scientist, leading to negative attitudes and achievements of Senior School Students. Invariably, the totality of one's environment contributes, a great deal, to individual's conception of the image of scientist. The images used in games, simulations, cartoons, videos, films, among others should be reviewed so as to incorporate equity and redirect the image of the scientist among students.

Also, gender has been a critical factor in understanding students' engagement in science and scientific career. Historically, the scientific field has been perceived as male dominated, perpetuating gender stereotypes that associate certain scientific subjects including Biology with specific gender. Notably, female students were tempted to believe that science is meant for male students, by referring to the history of male scientists without females, who contributed meaningfully in the study of scientific concepts and studies. According to [7], the scientists were Carl Linaeus (1707 - 1778), Charles Darwin (1809 - 1882), Gregor Mendel (1822-1844), Joseph Priestly (1733 - 1804), Alexander Flemming (1881 - 1955), William Harvey (1578 - 1657), Antonio Van Leenwehoek (1632 - 1723), Edward Jenner (1749 - 1823), Lious Pasteur (1822 - 1895), Sir Ronald Ross (1857 - 1922), Sir Frederick Gowland Hopkins (1861 - 1941) etc. These stereotypes may impact female students as aspirations and confidence in their ability to excel in Biology, potentially leading to gender disparities in academic achievements. Also, this male dominated subject shape perception which invariably affect students attitude in Biology. The study seek to investigate students' perceptions of the image of a scientist in enhancement of achievement and attitude to science in Bayelsa state.

LITERATURE REVIEW

[14] examined representations of Nature of Science (NOS) in high school chemistry textbooks over

the past four decades. This study focused on the representations NOS in high school textbooks in chemistry. It, also, looked at extent to which these representations have changed the last four decades. Data analyses focused on the tentative, empirical, inferential, creative, myths, theories, among others. 14 popular textbooks, including five "series" over many decades were analyzed. The accuracy, completeness and manner to which NOS is addressed within the range of -3 to +3 were used for scoring different sections of the textbooks. Findings revealed that representations of NOS in the textbooks were poor with a few exceptions. It, also, reported that textbook score has remained considerable same over forty years, decreased over the past four decades. It was recommended that focus on continuous assessment and evaluation strategies by the authority will, to a large extent, change in the ways NOS is addressed in science textbooks.

[15] examined Secondary School Students' perceptions about scientists using metaphors. 220 students from 6th and 8th grades of a Senior School in Central Districts of Ankara Province participated in the study. Censor sampling was used and all the students were used in the study. Data obtained from the study were coded by three coders and inter-rater reliabilities were found to be 0.94, 0.95 and 0.97. Findings revealed that students' perceptions regarding scientists had a highly complex structure.

[7] carried out a study to know the impact of gender on perceptions of Senior School Students on who the scientists are, using descriptive survey research design. The population of the study comprised 14,135 (7,713 male and 6,422 female) students in Public Secondary Schools in Delta State. The sample used in this study included 3,000 (1,500 male and 1,500 female) students. The instrument, "Perception-of-Scientists-Task" (POST) was used to collect responses from students. Simple percentage and Chi-Square statistics were used to analyze the data. The results revealed that 94.7% male and 98.7% female students believed that the scientists were men. Also, this study revealed that there was no significant difference between the number of male and female students who supported that the scientists were men.

[4] worked on Nature of Science as represented in chemistry textbooks used in Nigeria. The study employed NSTA document and literature---the analytical framework for the representations of NOS aspects, method used and the content relation to NOS in the textbooks. Findings revealed that NOS empirical nature, human endeavor, tentativeness, creativity and imagination were the most cited in all the three textbooks, while laws, theories, method of science and subjectivity were silent. Also, the interdisciplinary Nature of Science were neglected in more than half pages of the textbooks. Findings revealed more of implicit and historical approach used to link NOS aspects in the textbooks. Findings showed that examined textbooks have potential to add to students' knowledge of scientific literacy, but cannot completely enhance it without being reviewed.

Did [16] investigate methodological or dialectical in the reflections of scientific inquiry in Biology textbooks?. The sample size was four approved Biology textbooks by the Turkish Ministry of National Education (MONE) for grades 9--12. The Inquiry-Based Tasks Analysis Inventory (ITAI) was used for analysis. Results showed that activities in textbooks in compliance with the curriculum were not tailored to prepare students to do inquiry or comprehend what scientific inquiry is.

[11], in the Study of 240 Secondary Students in the Western part of Turkey in the full term of 2017/2018 full year, find out the impact of gender on the perception of scientists. With the data collected, utilizing Draw-a-scientist test, it was noted that the images of the male students were more traditional at 63.3%, while female images were less traditional at 44.6%. Supported that scientists were females or both males and females, there were significant differences between the number of male and female students.

The summary of reviewed relevant literatures show a scare literature of the historical view of the scientist shaping students' perceptions of the image of the scientist. Studies, also, show the omission of history of the scientist or brain behind Biology lessons in the teaching and learning processes which, significantly, affect attitude and academic achievement in Biology, hence, the content gap of the study. There is, also, little or no study on effect of students' perceptions of image of the scientist on academic achievement and attitude in Biology, hence, the literature gap of the study. It is on this background that the study sought to investigate students' perceptions of the image of a scientist in enhancement of academic achievement in Bayelsa State, Nigeria.

Statement of the Problem

In science education, particularly Biology, the integration of historical perspectives on scientific concepts and the scientists who pioneered them within the teaching-learning process has garnered significant attention. It is important to recognize that prevailing educational practices, to a large extent, adhere to the curriculum's prescribed structure and objectives, science educators, including Biology teachers, frequently present scientific concepts to students without reference to the notable scientists who made foundational contributions to these concepts. This oversight denies students the opportunity to connect with the rich history of scientific discovery and the individuals who shaped it. [17]. This gap is further underscored by an analysis of Biology textbooks and instructional materials commonly used in Senior Secondary Education in Nigeria. It is evident that essential scientific concepts are presented in isolation

from the scientists who were instrumental in their formulation and advancement. For instance, concepts such as taxonomy, cell theory, microscopy, disease causation, genetics and ecological principles are introduced without acknowledgment of the scientists like Carlus, Linnaeus, Robert Hooke, Mathias Schleiden, Theodor Schwann, Antonie van Leeuwenhoek, Ronald Ross, William Harvey, Gregor Mendel and Ernest Haeckel who contributed to their development [7].

The implications of this omission extend to the examination system as well. In both essay and objective formats of the Senior School Certificate Examination (SSCE), there is a notable absence of enough questions that require students to recall or engage with the historical contributions of scientists to biological concepts. This persistent neglect of the historical context of scientific inquiry raises concerns about the comprehensive understanding and appreciation of science among students [7].

Against this backdrop, and considering the significance of Biology as a fundamental and popular scientific field, it is important to investigate the perceptions that Senior School Biology Students hold regarding the image of a scientist. This study, also, aimed to ascertain the potential effects of students' perceptions on their academic achievement in Senior School Biology Education. The central inquiry of this research thus crystallized into the following pivotal questions: What are the perceptions of Senior School Biology Students regarding the image of scientists and how do these perceptions impact the enhancement of academic achievement of Senior School Biology Education?

Purpose of the Study

The main purpose of this study is to find out students' perceptions of the image of a scientist in the enhancement of academic achievement in Biology. Specially, the study determines,

1. The mean academic achievement of Senior School Biology Students perceptions of the image of the scientists.
2. Determine the mean academic achievement of Senior School Biology Students who percept that a scientist is male vis-à-vis their counterpart who perceived a scientist is a female.
3. Determine the mean academic achievement of Senior School Male Students in Biology who perceived that a scientist is a male and their female counterpart who, perceived that scientist is a male.
4. Determine the mean academic achievement of Senior School Male Students in Biology who perceived that the scientist is female vis-à-vis their female counterpart who, as well, perceived that a scientist is a female.

Research Questions

The following research questions were raised in this study:

1. What are the Senior School Biology Students' perceptions of the image of a scientist?
2. What is the academic achievement of Senior School Biology Students' who perceived that a scientist is a male vis-à-vis their counterparts who perceived that a scientist is a female?
3. What is the academic achievement of Senior School Male Students in Biology who perceived that a scientist is a male and their female counterparts who perceived that a scientist is a male?
4. What is the mean academic achievement of Senior School Male Students in Biology who perceived that a scientist is female vis-à-vis their female counterparts who, as well, perceived that a scientist is a female?

Research Hypotheses

The following research hypotheses guided this study:

1. There is no significant difference between the mean academic achievements of Senior School Biology Students who perceived that a scientist is a male and those whose perception is that a scientist is a female.
2. There is no significant difference in the mean academic achievements between the male and female Senior School Biology Students who perceived that a scientist is a male.
3. There is no significant difference in the mean academic achievements between the Senior School Male and Female Biology Students who perceived that a scientist is a female.

METHOD

Research Design

The study was guided by descriptive survey and ex-post-facto research designs. A descriptive survey approach was utilized to get information from a specific group of students to answer the research questions via questionnaire. The adoption of an ex-post-facto design further reinforced the investigation's retrospective nature, as the researcher also sought to delve into students' perceptions of the scientist's image in relation to pre-existing scores from their Students' School Promotion Examination Results (SSPER) [7]. This multifaceted approach ensured a robust foundation for analyzing the intricate interplay among perceptions, gender and academic performances in Senior School Biology.

Population of Study

The research encompassed 12,315 (6,313 male and 6,002 female) students from the public Secondary Schools in Bayelsa State [18]. Specifically, the study focused on students who actively participated in the Senior Secondary Two (SS2) Promotion Examination during the academic session of 2021/2022. This careful

selection was based on the premise that the SS3 class, having progressed beyond earlier stages of secondary education, possessed a foundational understanding of science subjects and an exposure to basic concepts related to scientists and their contributions.

Sample and Sampling Technique

The sample size was, randomly, selected in line with [19] assertions that in a non-experimental survey research design, (i) large sample size is needed to ensure smaller magnitude of sampling error, (ii) 20%-30% of the population sample size is adequate for a study and (iii) relatively large sample size is needed when the sample size is to be subdivided into two or more groups to be compared. The sample consisted of 1,233 male and 1,230 female Biology Students, respectively. However, 1,200 female and 1,209 male Biology Students, adequately, filled their questionnaires and returned it. Consequently, the researchers, purposively, selected 2,400 (1,200 males and another 1,200 females) Biology Students as sample size to avert the problem of unequal gender in terms of quantity and quality, as reported by [7].

Instruments for Data Collection

The data collection was done using the Perception of the Image of the Scientist Task (PIST) questionnaire and the Students School Promotion Examination Result (SSPER) records. The PIST questionnaire encompassed two distinct sections, A and B. Section A focused on gathering essential students' bio-data, while Section B consisted of, carefully, crafted items designed to elicit students' responses regarding their perceptions of the image of a scientist by ticking either Strongly Agreed (SA) or Agreed (A) or Disagreed (D) or Strongly Disagreed (SD) to enable the researchers, carefully, extract the number of Senior School Biology Students' who perceived that a scientist is a male or a female. Three experts, including an educational psychologist and two science educators, were engaged to validate the instruments, particularly, the Perception of the Image of the Scientist Task (PIST). The Cronbach Alpha reliability index of PIST was 0.89. This reliability index was adjudged to be very high and good enough for this study, using alpha coefficient procedure called the rule of the thumb [20].

Methods of Data Collection

The six question items in PIST was administered to the SS3 Biology Students, in order, to check their perceptions of the image of a scientist. The SSPER was used to collect the SS3 Biology students' gender and scores which were used for the analysis of data.

Methods of Data Analysis

Data were collected and arranged in tables. Frequencies, means and z-test statistics were used to analyze the data. Data were analyzed in relation to research questions and hypotheses, with implications discussed for Senior School Biology in Bayelsa State.

RESULTS

Research Question One: What are the Senior School Biology Students perceptions of the image of a scientist?

The answer to research question one is has shown in table 1.

Table 1: Image of scientist as perceived by Senior School Biology Students'

N/S	Perception	N	Male	Female
1	Scientist is a male	2,000	1,743	257
2	Scientist is a female	400	301	99
	Total	2,400		
3	Scientist is white skinned	1,537	629	908
4	Scientist is dark skinned	863	571	292
	Total	2,400		
5	Scientist is empiricist	1,350	1131	219
6	Scientist is superstitious	1,050	76	974
	Total	2,400		

Source: Researchers field work.

Table 1 indicates that out of 2,400 Senior School Biology Students, 2,000 and 400 students perceived a scientist as male and female, respectively. From the 2,000 students who perceived that a scientist is a male, 1,743 and 257 were male and female, respectively. Out of students who perceived a scientist as female, 301 were male and 99 were female students. 1,537 and 863 were of perceptions that a scientist is white skinned person and dark-skinned person, respectively, out of a total of 2,400 Senior School Biology Students. For those who perceived that a scientist is white skinned, 629 were males, while 908 were females. 863 Senior School Biology Students were of perception that a scientist is dark skinned, out of which 571 were males and 292 were females. 1,350 and 1,050 Senior School Biology Students were of perceptions that a scientist is an empiricist and superstitious, respectively. Out of 1,350 students, 1131 were males and 219 were females; from the 1050 students, 76 were males, while 974 were females.

Research Question Two: What is the mean academic achievement of Senior School Biology Students who perceived that a scientist is a male vis-à-vis their counterparts who perceived that a scientist is a female?

The answer to research question two is as shown in table 2.

Table 2: The Mean Academic Achievement of Senior School Biology Students according to perception

S/N	Perception of Students	N	$\bar{X}$	SD
1	Scientist is a male	2,000	60.3	11.8
2	Scientist is a female	400	58.6	9.5

Source: Researchers field work.

From table 2, it is evident that the mean academic achievement of Senior School Biology Students who perceived that a scientist is a male is higher than those of the students who perceived that a scientist is a female. Therefore, the mean academic achievement of students who perceived that a scientist is a male is more enhanced than the students who perceived that a scientist is a female.

Research Question Three: What is the academic achievement of Senior School Male Students in Biology who perceived that a scientist is a male and their female counterparts who perceived that a scientist is a male?

The answer to research question three is as shown in table .3.

Table 3: The mean academic achievement of male and female students who perceived scientist as a male

S/N	Gender Perception	N	$\bar{X}$	SD
1	Male Scientist is a male	1,743	57.5	7.4
2	Female	257	55.7	5.6

Source: Researchers field work.

Table 3 indicates that Male Students who perceived that a scientist is male has more enhanced mean academic achievement than their female counterparts who, also, perceived that a scientist is a male.

Research Question Four: What is the mean academic achievement of Senior School Male Students in Biology who perceived that a scientist is female vis-à-vis their female counterparts who, as well, perceived that a scientist is a female?

The answer to research question four is as contained in table 4.

Table 4: Mean Academic Achievements of Male and Female Students who perceived that a scientist is a female

S/N	Gender Perception	N	$\bar{X}$	SD
1	Male Scientist is a female	301	56.0	10.2
2	Female	99	58.5	11.4

Source: Researchers field work.

Table 4 shows that female students who perceived that a scientist is a female have an enhanced mean academic achievement than their male counterparts with the same perception.

Non-Hypotheses

H0~1~: There is no significant difference between the mean academic achievements of Senior School Biology Students who perceived that a scientist is a male and those whose perception is that a scientist is a female.

Table 5: Z -- test analysis of difference between the mean academic achievement of students who perceived that a scientist is a male and those who perceived that a scientist a female.

N/S	Students' Perception	N	$\bar{X}$	SD	df	Z-cal	Zcrit
1	Scientist is a male	2,000	60.3	11.8			
					2,398	1.53	1.96
2	Scientist is a female	400	58.6	9.5			

Source: Researchers field work.

From table 5, Zcal= 1.53 <Zcrit= 1.96, therefore, the H0~1~, is retained. This implies that the different perceptions of the students that a scientist is a male and, also, a female do not significantly affect

academic enhancement of Senior School Biology Students.

H0~2~: There is no significant difference in the mean academic achievements between the male and female Senior School Biology Students who perceived that a scientist is a male.

Table 6: Summary of z-test analysis of difference in mean academic achievement of student's perception that a scientist is a male by gender.

S/N	Gender Perception	N	$\bar{X}$	SD	df	Z-cal	Zcrit
1	Male Scientist is a male	1,743	57.5	7.4			
					1,998	1.99	1.96
2	Female	257	55.7	5.6			

Source: Researchers field work.

Z-test analysis in table 6 shows that Zcal= 1.99 >Zcrit= 1.96. So, the H0~2~ is rejected and its alternate hypothesis is accepted. This affirms that senior school male Biology students' perception that a scientist is a male, significantly, enhanced their academic achievement than that of their female counterparts who, also, perceived that a scientist is a male.

H0~3~: There is no significant difference in the mean academic achievements between the Senior School Male and Female Biology students who perceived that a scientist is a female.

Table 7: Z-test analysis of mean academic achievement of students who perceived that a scientist is a female by gender.

S/N	Gender Perception	N	$\bar{X}$	SD	df	Z-cal	Zcrit
1	Male Scientist is a female	301	56.0	10.2			
					398	2.52	1.96
2	Female	99	58.5	11.4			

Source: Researchers field work.

Summary of Z-test computation in table 7 confirms that Zcal= 2.52 >Zcrit= 1.96. As a result, H0~3~ is rejected, while its alternate hypothesis is accepted. This indicates that Senior School Female Biology Students' perception that a scientist is a female, significantly, enhanced their academic achievement more than the mean academic achievement of the Senior School Male Biology Students who perceived that a scientist is, also, a female.

DISCUSSION

The finding in this study that more Senior School Biology Students are of perception that a scientist is male than those who perceived a scientist as female agrees with the findings of [7, 17], [11] and Chambera in [11] in their separate studies. The probable reasons for this agreement might be that the difference in the social experience of men and women gave them (male and female) different ways of looking at life and interpreting events and, so conferred on them different standpoints. The findings that more males and females perceived that a scientist is a male as against the perception of their counterpart that a scientist is a female agree with the finding of Chambera in [7] and [11]. The probable reason might be that science, according to Harding in [17], is gender biased, science according to Harding, is developed, primarily, from the perspectives of men; women experiences have been neglected as starting points in scientific researches and as generators of evidence for or against knowledge claims. It, also, agrees with Ocal in [11] who reported that students' perception of a scientist was a male figure, having qualities such as diligent, wearing a lab coat and bald. Reviews in [11], also, showed that over the years, perception of students of science and scientist is male dominated.

The finding that there is no significant difference in mean academic enhancement between the Senior School Biology Students who perceived that a scientist is a male and those whose perception is that a scientist is a female disagrees with the findings of [17, 7] and [21]. The probable reason for this disagreement might be that the present researchers used Senior School Three (SS3), while [17, 7] and [21] involved different Senior School Students in their studies. Another probable reason might be that the present researchers used Biology Students, while [17, 7] and [21] involved students in different subject areas.

The findings in this study, that the mean academic achievement of Male Senior School Biology Students who perceived that a scientist is a male is higher than their female counterparts who, also, perceived that a scientist is a male and that the difference in the mean academic achievement is significant, agree with the findings of Kelly and Rosser in [7] and [15]. The probable reasons for a female to perceive that a scientist is a male might be because of inherent masculine Nature

of Science at the success level, deeps epistemological level and in the nature of knowledge that is accepted as scientific. Another finding of this study shows that Male Senior School Biology Students whose perception is that a scientist is a female had a lower mean academic achievement than their female counterparts with the same perception and that the mean academic achievement difference is not significant are not in alignment with the findings of [7]. The probable reason for this state of affairs might be that girls who perceived that a scientist is a female might have been taught by female science teachers/scientists who genuinely struggled with them.

CONCLUSION

The study, students' perception of the image of the scientist in enhancement of academic achievement in Senior School Biology is crucial in teaching and learning today as the Nigerian students are faced with competition and challenges in the national and global arena. These challenges are due to shaped perceptions of the image of the scientist which has invariably affect academic achievement of Biology Students. The findings revealed that both male and female students perceptive that the scientist is a male. The study is limited to sample bias as only two Local Government Areas were used in the study which does not cover other areas. Many of the work reviewed was carried out at different points, measuring perceptions at different angles, hence, it becomes difficult to find a causal link whether positive or negative. It is, also, assumed that students took the same examination and academic achievement is influenced by many other factors other than perception of the image of the scientist. Based on the findings, more female Biology teachers should engage in teaching and learning. Curriculum planners should be conscious of gender bias in the design and choice of textbooks in science classrooms and authors of textbooks should avoid gender disparity in their work.

Recommendations

Based on the findings, the study recommended the following:

1. Students should be exposed to the historical concept of science and the brain behind it so as to understand the nature of science and enhance academic achievement.
2. Special attention should be paid to the female folk in order to bridge the gap created over the years, by giving the female priority in the textbook, media and science related courses.
3. Role play using the female gender, science activities and visit to scientist so that students can connect theory to practical for better comprehension.
4. There is need for a review of science textbooks in order to ensure proper inclusion and representation of gender in its diversity.

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