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# PERCEPTIONS OF SENIOR SECONDARY SCHOOL BIOLOGY TEACHERS ON GENDER TRANSFORMATIVE CURRICULUM REFORMS IN KWARA STATE, NIGERIA

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**ABSTRACT**
*Educational Stakeholders had carried out series of studies on Curriculum reforms. Curriculum developers are among the educational stakeholders and Biology Teachers whose studies dealt with reviewing the curriculum but none has dealt with gender transformation reform. Hence, this study examined the perceptions of Biology Teachers on the transformation of the curriculum reform. A descriptive research design of the survey type was adopted for the study. The population comprised all the Biology teachers in Kwara State, Nigeria. A sample of 720 Biology teachers who volunteered to participate in the study were selected using purposive sampling techniques. A researcher-designed questionnaire with reliability coefficient of 0.78 was used for data collection. The data analysis was through Mean ($\bar{X}$) with cut-off score of 2.50, while independent sample t-test and Analysis of Variance (ANOVA) were used to test the hypothesis at 0.05 level of significance. The finding of the study was that: (i)there was significant difference in the perceptions of Biology teachers on the curriculum transformative reforms based on their gender ($t_{(2717)}$= 0.06, $p > 0.05$)which was in favour of male Biology teachers. The study concluded that most Biology teachers were favorably disposed to the use of curriculum transformative reforms in their class instruction. This implies that when the curriculum is well reformed, there would be an effective teaching and learning of Biology in the senior secondary schools. The study recommended that male Biology teachers should implement the use of transformative reform of curriculum for better classroom instruction.*
***Keywords**: Curriculum, perception, Biology, and Gender*

## INTRODUCTION

Education occupies a central position in national development discourse, particularly in societies where human capital formation is considered the primary driver of socio-economic transformation. In Nigeria, education is formally positioned as an instrument for achieving national development and social change, with the National Policy on Education emphasizing the optimisation of individual creative potentials, skills acquisition, and the development of a competent workforce for the demands of the twenty-first century (Federal Republic of Nigeria, 2013). Within this framework, education is not only expected to transmit knowledge but also to cultivate problem-solving capacities, practical competencies, and adaptive learning skills that align with global technological and scientific advancement (Adeoye, 2022).

In reinforcing this developmental orientation, policy and scholarly perspectives consistently argue that Nigeria's educational system must evolve beyond theoretical instruction towards more practical, experimental, and technology-supported learning environments. Sanubi and Akpotu (2015) maintain that the realisation of national educational goals depends largely on the extent to which teaching practices are made practical and science-oriented, with particular emphasis on improving science education at all levels. This position is further strengthened by the understanding that scientific literacy is foundational to democratic participation, technological innovation, and sustainable national development, especially in developing economies where technological dependence remains high (Abimbola, 2013; Abanikannda & Ajani, 2019).

Science education, therefore, assumes a strategic role in preparing learners to understand and engage with the natural and technological world. Biology, as a core science subject, is particularly significant in this regard. It provides foundational knowledge for understanding living

systems and has contributed to major scientific and medical advancements, including genetic engineering, hybrid production, and disease control innovations (Abdulkadri, 2022). Beyond its scientific relevance, biology education is intended to prepare learners for diverse professional pathways such as medicine, pharmacy, nursing, and education, while also fostering critical thinking that challenges superstition and promotes evidence-based reasoning.

However, the effectiveness of biology education is strongly dependent on curriculum implementation, which is largely mediated by teachers. Curriculum, in this context, is not merely a document but a structured framework of learning experiences designed to achieve educational goals across classroom and non-classroom contexts (Yusuf, 2024). Its success is therefore tied to the capacity, orientation, and pedagogical practices of teachers responsible for its execution. Consequently, biology teachers play a decisive role in translating curriculum intentions into meaningful classroom experiences, and their professional competence becomes central to learning outcomes.

In recent years, increasing attention has been directed towards curriculum reform, particularly transformative curriculum approaches aimed at improving instructional relevance, inclusiveness, and alignment with contemporary societal needs. Educational stakeholders, including curriculum developers and classroom practitioners, have engaged in various reform initiatives intended to strengthen teaching effectiveness and learner engagement. These reforms are often supported through professional development, instructional materials, and reflective teaching strategies that encourage alignment with educational standards and collaborative practice (Yusuf, 2024). Despite these efforts, questions remain regarding how these reforms are perceived and operationalised by teachers at the classroom level, particularly within science subjects such as biology.

Within this context, biology teachers become a critical focus of inquiry, especially given their direct responsibility for implementing curriculum reforms. Importantly, teacher characteristics such as gender may also shape perceptions and instructional responses to curriculum change. Gender, in educational discourse, has been identified as a variable that can influence access to opportunities, pedagogical orientation, and professional experiences, thereby contributing to differential engagement with educational reforms. Understanding whether such differences exist is essential for ensuring equity and effectiveness in curriculum implementation.

Against this backdrop, this study is concerned with examining how senior secondary school biology teachers perceive transformative curriculum reforms in relation to instructional practice in Kwara State, Nigeria. Specifically, the study is guided by the need to understand how these teachers interpret and apply curriculum reforms within their instructional settings, and whether such perceptions vary across gender categories. The central concern is therefore situated within the broader challenge of ensuring that curriculum reforms translate meaningfully into classroom practice in a way that enhances science education outcomes.

The study is anchored on the objective of investigating the perceptions of senior secondary school biology teachers on the application of transformative curriculum reform to instruction, with particular attention to gender-based differences in these perceptions. In operational terms, it seeks to determine the extent to which teachers perceive and apply curriculum reforms in their instructional practices, as well as whether male and female

biology teachers differ significantly in their perceptions of such reforms.

In line with this objective, the study is guided by the research questions of how senior secondary school biology teachers perceive the application of transformative curriculum reform to instruction, and whether gender influences these perceptions. Correspondingly, the study tests the hypothesis that there is no statistically significant difference between male and female senior secondary school biology teachers in their perceptions of the application of transformative curriculum reform to instruction.

Overall, the study is situated within the broader policy concern of strengthening science education through effective curriculum implementation, while also contributing empirical insight into how teacher characteristics intersect with reform processes in shaping instructional outcomes.

## LITERATURE REVIEW

### Conceptual Review of Transformative Curriculum Reform

Transformative curriculum reform refers to a deliberate and systematic restructuring of curriculum content, pedagogy, and assessment with the aim of producing meaningful shifts in how learners acquire knowledge, skills, and dispositions relevant to contemporary societal needs. Unlike incremental curriculum adjustments, transformative reforms are characterised by a deeper reorientation of educational goals toward critical thinking, problem-solving, learner-centred pedagogy, and responsiveness to socio-economic realities (Fullan, 2007). In this sense, curriculum reform is not merely a technical adjustment but a structural intervention in how teaching and learning are conceptualised and delivered.

From a policy perspective, transformative curriculum reform is often driven by the need to align education systems with global competencies such as scientific literacy, digital fluency, and innovation-driven learning. The Organisation for Economic Co-operation and Development (OECD, 2018) argues that modern curriculum reforms increasingly emphasise competencies rather than rote knowledge acquisition, reflecting a shift towards preparing learners for complex and uncertain environments. In the Nigerian context, this reform orientation is reflected in continuous curriculum reviews aimed at improving science education delivery, enhancing employability skills, and strengthening national development outcomes.

Theoretically, transformative curriculum reform is anchored in constructivist learning theory, which posits that learners construct knowledge actively through experience rather than passively receiving information. This perspective places the teacher at the centre of instructional transformation, as curriculum reform can only be meaningful when translated into classroom practice through pedagogical innovation. Consequently, the success of transformative curriculum reform depends not only on curriculum design but also on teachers' interpretation, acceptance, and implementation of its principles.

However, empirical literature suggests that the implementation of curriculum reform often encounters challenges such as inadequate teacher training, limited instructional resources, and resistance to change. These constraints can weaken the intended impact of reform policies, particularly in science education where practical engagement is essential. Therefore, transformative curriculum reform should be understood as a dynamic process that requires continuous teacher support, institutional alignment, and reflective practice to achieve meaningful educational change.

**Conceptual Review of Biology Teachers' Instructional Practice and Perception**

Biology teachers' instructional practice refers to the methods, strategies, and pedagogical decisions employed by teachers in facilitating the teaching and learning of biology concepts in the classroom. It encompasses lesson planning, instructional delivery, classroom interaction, use of teaching aids, and assessment practices. Effective instructional practice in biology is particularly significant because the subject demands both conceptual understanding and practical engagement with scientific phenomena (Abdulkadri, 2022).

In conceptual terms, teacher perception plays a critical role in shaping instructional practice. Perception refers to the cognitive and interpretive processes through which teachers understand, evaluate, and respond to curriculum expectations, reforms, and classroom realities. According to Ajzen's Theory of Planned Behaviour, attitudes and beliefs significantly influence behavioural intention, suggesting that teachers' perceptions of curriculum reform are likely to determine how they implement it in practice (Ajzen, 1991). Thus, positive perceptions of curriculum reform are often associated with higher levels of instructional adaptation and innovation.

In biology education, instructional effectiveness is closely tied to teachers' ability to translate abstract scientific concepts into observable, relatable, and practical learning experiences. This requires not only subject mastery but also pedagogical flexibility and curriculum literacy. Yusuf (2024) emphasizes that curriculum implementation is fundamentally dependent on teachers, as they serve as the direct interface between curriculum design and learner experience. Therefore, biology teachers are not passive implementers but active interpreters of curriculum intent.

Furthermore, teacher perception is shaped by multiple contextual variables, including professional training, teaching experience, institutional support, and gender. Gender, in particular, has been identified in educational research as a factor that may influence classroom interaction styles, confidence levels, and responsiveness to reform initiatives. While findings remain mixed, some studies suggest that male and female teachers may differ in their openness to instructional innovation due to socialisation patterns and professional experiences.

In sum, biology teachers' instructional practice and perception are central to the success of curriculum reform initiatives. Without favourable teacher perception and effective pedagogical engagement, even well-designed curricula may fail to achieve their intended outcomes. This makes the study of teachers' perceptions not only relevant but essential in understanding the real impact of transformative curriculum reforms in science education.

**Overview of Biology**

Biology is a branch of science that involves the study of life. Biology is such a broad field, covering the minute working of chemical machines inside our cells, to broad scale concept of ecosystem and global climate change. Eldon (2007) in Abdulkadri, (2022) stated that the nature of science and the fundamental biological concept is so important for any person, regardless of his or her occupation. Biology as a subject covers various topics that are life's processes, e.g. movement, respiration, nutrition, irritability, growth, excretion and reproduction. The life's processes are characteristics of all living things that have life and

carry out life's activities. Biology education is beneficial to individuals in the following ways;

1. It prepares the individual for their choice of careers such as medicine, agriculture, and teaching.
2. It helps human beings to understand the parts of their bodies and their functions.
3. It enables human beings to question superstitions due to sustained interests arising from the comprehension of causes and events.
4. It brings into focus, the need to maintain good health, for example; good sanitation, eating an adequate diet, vaccination against diseases, exercise and adequate rest.
5. It powers the understanding of the relation of human beings to their environment as well as knowledge of the inter-relationships existing between living and non-living things in their environment (Sarojini, 2011).

The National Policy on Education emphasizes the teaching and learning of science at all levels of our educational system. The policy stated that science education should emphasize the teaching and learning of science process and principle. This will lead to fundamental and applied research in the science at all levels of education (FRN, 2014).

Curriculum according to Wikipedia (2016) is the planned interaction of pupils with instructional contents, materials, resources and processes for evaluating the attainment of educational objectives. Olorundare (2014) described it as a structured, series of intended learning outcomes. The biology curriculum was jointly developed by the Comparative Education Study and Adaption Centre (CESAC) University of Lagos and the Science Teachers Association (STAN). In 1985, curriculum was introduced into Nigeria Secondary Schools for implementation. The new biology curriculum was adapted and revised from 1985 edition developed by Comparative Education Study and Adaptation Centre (CESAC). The objectives of this curriculum have been derived from the National Policy on Education (FRN, 2014) and the main objectives are to prepare students to acquire:

i. Adequate laboratory and field skills in biology;
ii. Meaningful and relevant knowledge in biology;
iii. Ability to apply scientific knowledge to everyday life in matters of personal and community health and agriculture;
iv. Reasonable and functional scientific attitude;

In pursuance of the stated objectives, the content and context of the curriculum places emphasizes on field studies, guided discovery, laboratory techniques and skills along with conceptual thinking. The current senior secondary school science curriculum, which was an outgrowth of the one developed earlier by CESAC, was developed in 1985 (Federal Ministry of Education, FME, 1985) to include Agricultural Science, Biology, Chemistry and Physics. The biology section was organized under seven themes. The 2009 edition of the Biology Curriculum (NERDC, 2009) now has only four themes.

These four themes include:

Theme 1: Organization of life

Theme 2: Organization at work

Theme 3: The organisms and its environment

Theme 4: Continuity of life

Science subjects have lost out in the new senior secondary school curriculum because it is no

longer a requirement for senior secondary school students to offer one science subject as a part of the core subjects. The new core subjects are: English studies, General Mathematics, Civic Education, Computer Science, and One Trade/Entrepreneurship subject (Abimbola, 2013). How do we then produce a scientifically literate society devoid of ignorance and diseases when the themes that are of direct relevance to the society and the learners are no longer available to all students?

In planning the new biology curriculum, the spiral approach to sequencing a science course was adopted. In the approach, the concepts to be taught are arranged in such a way that they run throughout the three-year post basic course, with the concepts being discussed in greater depth as the course progresses.

The curriculum is organized into six sections:

1. Topic
2. Performance objectives
3. Content
4. Activities-Teacher and Students
5. Teaching and Learning Materials
6. Evaluation Guide

According to West African Senior Secondary School Certificate Examinations' Syllabus (2015), the inclusion of biology in the Secondary School Curriculum is aimed at achieving the following objectives:

i. Understanding of the structures and functions of living organisms as well as appreciation of nature;
ii. Acquisition of adequate laboratory and fields skills in order to carry out and evaluate experiments and projects in biology.
iii. Acquisition of necessary scientific skill, for example, observing, classifying and interpreting biological data.
iv. Relevant knowledge in biology needed for future and advanced studies in biological science.
v. Acquisition of Scientific attitudes for problem solving
vi. Ability to apply biological principles in everyday life in matters that affect personal, social, environmental, community health and economic problems.

According to the National Examinations Council (SSCE) Syllabus (2015), the aims and objectives of biology as derived from the National policy of Education (FRN, 2014) are as follows:

a. Mastery of the structure and function of living
b. Appreciation of nature and the needs of its conversation.
c. Acquisition of adequate laboratory and field skills in biology necessary to carry out and evaluate experiments and projects in biology.
d. Ability to observe, classifies, and interprets Biological data (the Scientific Skills).
e. Acquisition of meaningful and relevant knowledge in biology as a Pre-requisite for pursuit of careers in Biological Science and related discipline.
f. Acquisition of acceptable scientific attitude for solving problems and;
g. Ability to apply biological knowledge/thoughts to everyday life in matters of personal, social, economic, environmental, and community health (P.39).

The biology curriculum has topics that are organized into instructional units in order to enable the concepts and skills to be treated throughout the three years duration of the senior secondary school. The topics are arranged in segmental and concentric forms that create a room for the recurrence of the concepts in previous years. This as therefore raise the need for biology teachers to be creative and use instructional strategies such as study technology principles that can encourage and develop students' conceptual thinking rather than encourage them to be a passive receiver of knowledge who are totally dependent on the teachers.

Gender is referred to as social attributes and opportunities associated with being a male or a female. It has to do with the relationship between women and men, boys and girls. These attributes and opportunities are socially constructed and learned through socialization process. Gender determines what is expected, allowed and valued in a woman or a man in a given context. The differences in societal value of men and women in terms of responsibilities, activities undertaken, access and control over resources as well as decision taken are all gender based Abidoye, (2015).Personality traits and characteristics are biological as well as environmental. Gender is a universal dichotomy in any given culture and strict gender behavioural traits are believed to produce inhibitions, especially for females, which may lead to inhibitions in achievement and success situation. Males inhibit females from subjects, careers and specialization which have been stereotypically ascribed to them Abidoye (2015). Awodun, Oni, and Oyeniyi (2015) examined the influence of teacher's gender in secondary school students' performance in Physics in Ekiti State, Nigeria. A total of 200 SS II Physics students in randomly drawn from ten secondary schools in Ikere Local Government Area of Ekiti State constituted the sample. ANOVA was used to analyse the three hypotheses formulated for the study.

The findings showed that there is significant difference in the performance mean scores of boys taught by male and that of those taught by female Physics teachers, there is significant difference in the performance mean scores of girls taught by male and that of those taught by female teachers and there is significant difference in the performance mean scores of students taught by male and that of those taught by female Physics teachers. Igberadja (2016) investigated the effects of teachers' gender and qualification on students' performance in industrial safety. Purposive sampling technique was used to select the TED112 result of students for 4 sessions. Two sessions each was selected based on the lecturers' gender and qualification. However, 2007/2008, 2008/2009, 2009/2010, and 2013/2014 Session results were used as sample of the study. Therefore, the sample of the study was 91 undergraduate students. No instrument was developed in this study rather a letter was used to request for data. Data collected was analysed using mean for the research questions and ANOVA (Analysis of variance) to test the hypotheses. The result revealed that the teachers' gender and qualification do not have any significant effects on students' performance in Industrial Safety.

Babajide (2010) found that gender has no significant influence on the students' achievement in science. Also, from the findings of Ayodeyi (2010), result showed that a significant difference existed between gender stereotype belief, attitudes and practices of male and female teachers. Babalola and David, (2011) carried out an investigation on Biology teachers on difficulty level. The study showed that there is no significant difference in perception of difficult topics based on their gender. Akinsola, (2014), the study revealed that the gender

of Biology teachers affect, their attitudes towards Improvisation of instructional materials. Kola and Taiwo, (2013), also observed in their various studies that there is no significant difference between the attitudes of males and females Biology teachers towards the use of improvised instructional materials. Ejifugha and Oguari (2011) investigated the problem with gender equity, an analysis of the data obtained in the study revealed that the emerging enrolment statistics in Science teacher education is female dominated, leaving the males trailing behind and they also found out that male dominated science and technology education in the nation's educational development. It was observed by Adebayo (2010) investigated on the science teachers' perception towards using information and technology for instruction and she observed that population of female teachers was higher than the population of male teachers in the area of ICT. She reported that gender inequality is also noticed. This has probably led the World Bank to start the gender ad ICT Seminar in the year 2000 (Gender). The purpose was to bridge the gender digital division. Ahmed, Ismail and Danmole, (2017) carried out a research on senior secondary school Biology teachers' perception of their needs in Kwara state; purposive and stratified random sampling technique were used to select two hundred and fifty (250) biology teachers from the three senatorial districts in the state. Descriptive statistics in form of frequency counts and mean were used to rank the needs of biology teachers. Chi-square statistical tools were used to analyse the data collected. Two research questions and four hypotheses were raised and tested. The findings revealed that there was a significant difference between perceptions of teachers' on their academic needs based on gender and that male biology teachers want more of academic needs than their female counterparts. Okoro, Ekanem and Udoh (2012) investigated the effect of teachers' gender on the academic performance of children in primary schools in Oyo Metropolis. Using the stratified random sampling technique, three schools were selected for the study from which 60 pupils were co-opted using stratified purpose sampling technique. Using an ex-post facto design, the researchers collected academic performance data based on the first term examination and continuous assessment of the selected students for data analysis which was carried out using 2-factor analysis of variance (ANOVA) with replication of the three schools. The results showed that teacher-pupil gender interactions do significantly affect pupils' academic performance as evidence in the differences between the performances of boys taught by male teachers and boys taught by female teachers and girls taught by male teachers.

Udousoro (2012) viewed the effect of gender and mathematics ability on academic performance of students in chemistry. The sample size comprises of 100 SS1 Chemistry students in two sec schools in Oyo metropolis. The instruments used were the chemistry achievement test (CAT) and the Mathematics ability test (MAT). Independent t-test statistics tools were used to analyse the data collected. The results of the test indicated that gender does not have any significant effect on the academic performance of students in Chemistry. Odogwu, Adeyemo, Jimoh andYewonde (2011) examined the gender differences amongst science, mathematics and technology (SMT) teachers with regards to the school environment variables as the association of these variables with teachers' professional background and school characteristic. A questionnaire was used to collect data from a sample of 275 female and 260 male SMT teachers. A multiple analysis of variance revealed a statistically significant gender difference on the

combined nine school environment variables .Analysis further revealed a significant gender differences in SMT teachers' perceptions of work pressure and principal leadership persisted after controlling for teachers' background and characteristics.

In the study of Oyedeji (2005) examined the influence of sex on the teaching of ecology. The researcher used Chi- square ($x^2$) instrument to rate male and female biology teachers. For the study, the researcher sampled 500 teachers 290 males and 210 females across all the 6 geo-political zones in Nigeria. The result of the findings revealed that male and female biology teachers were not significantly different in their views on the opinion that ecology is difficult, on methods they employed, no knowledge of the subject matter content and attitudes toward their teaching, Hence sex had no influence on the teachers teaching of ecology. The study of Abiri and Ugborugbo (2008) examined the influence of gender on the productivity of secondary school teachers in Delta State, Nigeria. The study was descriptive in nature and involved 979 teachers made up of 460 males and 519 females. Two sets of questionnaires and a rating scale were used to collect data for the study. The results showed that there was a significant difference in the productivity of male and female teachers, the male teachers were generally more productive than their female counterparts but the female teachers were more influenced by location than the male teachers.

Also, Lawrence (2016) examined the perception of chemistry teachers on the factors affecting effective utilization of information and communication technology (ICT) in the teaching and learning of chemistry in Kogi State. The sample for the study consisted of 105 chemistry teachers randomly selected from a total population of 448 chemistry teachers in the public secondary schools in Kogi State through purposive random sampling. A 16- item questionnaire was developed, validated and used by the researchers to the data. Mean and standard deviation were used to analyse the research questions while t-test was used to analyse the hypothesis. The results revealed that chemistry teachers had the perception that factors such as lack of funds and training among others affect their effective utilization of ICT in teaching chemistry. The results also showed that there was no significant difference between male and female chemistry teachers' mean perception scores on the factors affecting effective utilization of ICT in teaching and learning chemistry relationships.

Ngwu, Ellah and Emmadiole (2019) investigated on the strategies for improving human capital development in biology as perceived by biology teachers. The study was carried out in Aguatta Education zone, Anambra state. Fifty (50) biology teachers in senor secondary schools in Aguatta Education zone formed the sample for the study. Biology Teachers capital Development Scale (BTCDS) developed by the researchers with a reliability coefficient of 0.83 obtained through Cronbach's alpha method was used for data collection. The data obtained was analysed using mean, standard deviation and t-test statistics. The findings revealed that there is no significant difference between male and female biology teachers' perceived strategies for improving human capital development in biology education for the enhancement of Science Technology, Engineering and Mathematics (STEM) education. Findings also shows that there is no significant difference in biology teachers'perceived challenges facing human capital development in biology education based on gender.

**Theoretical Review**

This study is anchored on learning and behavioural theories that explain how curriculum reforms are

interpreted, accepted, and translated into classroom practice by teachers. Two interrelated theoretical perspectives are particularly relevant: **Constructivist Learning Theory** and the **Theory of Planned Behaviour (TPB)**. Together, they provide a coherent explanation of curriculum implementation dynamics and teacher decision-making processes.

**Constructivist Learning Theory**

Constructivist Learning Theory, largely associated with the works of Piaget and Vygotsky, posits that knowledge is not transmitted in a fixed form but actively constructed by learners through interaction with their environment, prior knowledge, and social context (Piaget, 1972; Vygotsky, 1978). In this framework, learning is an active, contextualised, and meaning-making process rather than passive reception of information.

Within the context of curriculum reform, constructivism provides a strong theoretical foundation for transformative curriculum design. Transformative curriculum reforms typically emphasise learner-centred instruction, inquiry-based learning, experimentation, and critical thinking, all of which align with constructivist principles. Biology as a discipline naturally fits within this framework because it requires observation, experimentation, and conceptual interpretation of living systems.

Importantly, the constructivist perspective positions the teacher as a facilitator rather than a transmitter of knowledge. This implies that the effectiveness of curriculum reform depends heavily on teachers' ability to redesign instructional strategies that encourage active learning. In this sense, biology teachers' perceptions of curriculum reform become crucial, as their understanding of constructivist principles will influence how they implement reform-based instructional approaches in the classroom.

However, the theory also assumes that teachers possess the necessary pedagogical autonomy, content knowledge, and institutional support to enact constructivist practices. In contexts where these conditions are weak, curriculum reforms may remain largely theoretical rather than practically realised.

**Theory of Planned Behaviour (TPB)**

The Theory of Planned Behaviour, developed by Ajzen (1991), explains human behaviour as a function of three key determinants: attitude toward the behaviour, subjective norms, and perceived behavioural control. According to the theory, an individual's intention to perform a behaviour is the most immediate predictor of actual behaviour.

Applied to this study, biology teachers' instructional practices and engagement with curriculum reform are shaped by their attitudes toward transformative curriculum changes, the professional and institutional expectations surrounding them, and their perceived capacity to implement such reforms effectively. Teachers who view curriculum reform positively are more likely to demonstrate willingness to adopt innovative teaching strategies, while those with negative perceptions may resist or superficially comply with reform demands.

Perceived behavioural control is particularly significant in the Nigerian educational context, where factors such as inadequate teaching resources, large class sizes, and limited professional development opportunities may constrain teachers' ability to implement curriculum reforms effectively. Thus, even when teachers have favourable attitudes, structural limitations may reduce actual implementation levels.

The theory also helps explain potential gender differences in perceptions and implementation

behaviour, as male and female teachers may differ in confidence levels, access to professional support, or social expectations within the school environment. These differences can translate into variations in how curriculum reforms are perceived and enacted.

**Synthesis of Theoretical Framework**

When combined, Constructivist Learning Theory and the Theory of Planned Behaviour provide a comprehensive lens for understanding this study. Constructivism explains the pedagogical logic behind transformative curriculum reform, while TPB explains the behavioural mechanisms through which teachers interpret and implement such reforms.

Together, they suggest that effective curriculum transformation is not solely dependent on policy design but also on teachers' cognitive interpretations, attitudinal orientation, and perceived capacity to act. In the context of biology education, this means that curriculum reform outcomes are ultimately mediated by teachers' beliefs and behavioural intentions.

METHODOLOGY

This study was a descriptive research of the survey type in which data were collected from a sample of individuals from a specific population. Akweziulo and Agu (2011) defined survey research as one in which a researcher studies a group of people or items by collecting and analysing data from only a few people or items considered to be the representative of the entire group. Descriptive research of the survey type was considered appropriate for this study because data were collected, analysed and reported as they exist. The sampled population was asked questions according to standardized procedures, with the aim of obtaining a composite report on their perception, with regards to particular aspects of their work. Data obtained were used to describe the population and the way they relate to their perception.The population for this study comprised all the senior school biology teachers in both public and private schools in Kwara State, Nigeria. The sample was drawn from all the senior secondary schools in the sixteen Local Government Areas of Kwara State, Nigeria. The purposive sampling techniques were used to select a total of 720 senior school Biology teachers from four hundred and seventy-eight (478) schools in the sixteen Local Government Areas in Kwara State. The reason alluded for this was that, the biology teachers who were available when administering copies of the questionnaire in both public and private senior secondary schools in the state were selected.

Seven hundred and twenty Biology teachers were sampled because those selected were those that filled the copies of the questionnaire appropriately. Seven hundred and twenty (720) Biology teachers were sampled from all the Biology teachers in Kwara State. Four hundred and seventy-four (474) Biology teachers from the Two-hundred and fifty-nine (259) public senior secondary schools in Kwara State were selected (Kwara State Teaching Service Commission, 2019)and Two- hundred and forty-six (246) Biology teachers were selected from Two hundred and nineteen (219) private senior secondary schools in Kwara state(Quality Assurance Bureau Headquarters Ministry of Education and Human Capital Development, Ilorin, Kwara State 2019). The descriptive statistics of the mean score, and pie charts were employed for the personal information section of the questionnaire and the research questions were answered using percentages, mean scores, and standard deviation, while the inferential statistics of the t-test and Analysis of Variance (ANOVA) were used to test the hypotheses. Hypotheses 1 was tested using independent sample

t-test at 0.05 alpha level of significance because the three hypotheses had an independent variable with two levels each, that is, gender which was either male or female. The dependent variables are the Biology teachers' response to the questionnaire items. Four-point, Likert scale was used as rating scale of the items in section B as follows: Strongly Agree, Agree, Disagree and Strongly Disagree was used for the questionnaire. In order to convert these ordinal scales to interval scale, a weighting was given to each point in the scale as follows: Strongly Agree (SA) 4 points; Agree (A)3 points; Disagree (D) 2 points; Strongly Disagree (SD) 1 point.

The response of the biology teachers' perceptions were transformed to either positive or negative perception by summing up the four responses, strongly agreed, agreed, disagreed and strongly disagreed which was 10 divided four (4) Likert scale which gives 2.50. So, any biology teachers' response that is greater than (>) this was positive perception, while any response that was less than (<) 2.50 was negative perception. All the analyses were done with the aid of Statistical Package for Social Science (SPSS) Version 23 and the results were subjected to statistical analysis at 0.05 level of significance.

## 4. RESULTS AND FINDINGS

Descriptive analysis of the number for senior secondary school biology teachers that were involved in the study was presented using frequency count and pie charts. The independent sampled *t*-test was used to answer the research question and research hypothesis respectively, t-test was used to test hypothesis 1. Finally, findings from the analysis is summarised below. The analyses and results are presented in table 1.Table 1 shows the distribution of the biology teachers based on gender. Out of 720 respondents who appropriately filled the questionnaire 339 (47.1%) were male Biology teachers, while 381 (52.9%) were female. This shows that female Biology teachers who participated in the study were more than their male counterparts.

The Pie chart showing the distribution of Biology teachers based on gender is Figure 1 where 47.1% of the population were male and 52.9% were female Biology teachers.

**Table 5:** *Distribution of Biology Teachers Based on Gender*

| Gender | Frequency | Percentage |
|---|---|---|
| Male | 339 | 47.1 |
| Female | 381 | 52.9 |
| Total | 720 | 100.0 |

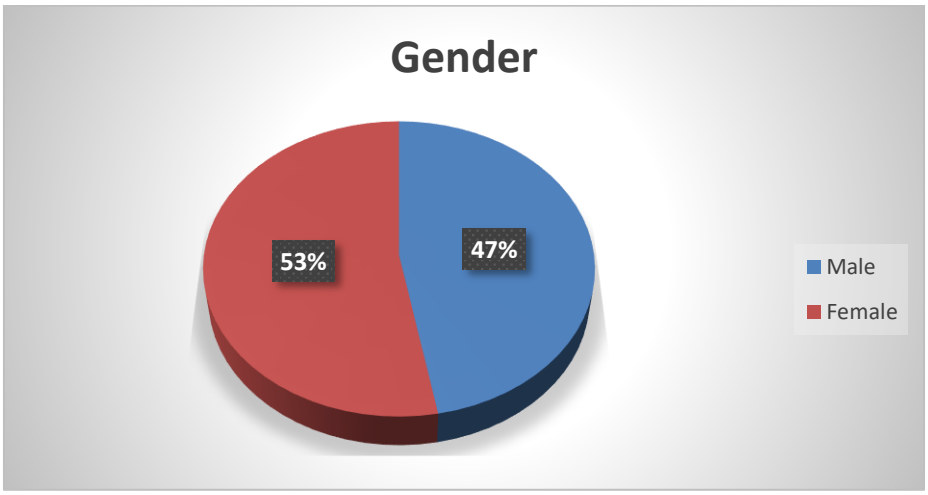



**Figure5:** *Pie Chart Showing the Distribution of Biology Teachers based on Their Gender*

**Research Question 1:** What are the perceptions of senior school Biology teachers on application of tranformative curriculum reform to instruction?

In analysing research question 1, the responses of the biology teachers (means) for all the twelve questionnaire items except one had positive perceptions (with the highest mean of 3.48) to the application of the transformation curriculum reform to instruction, while the only questionnaire item with negative perception had a mean of 2.44

**Table 1:** *t-test Analysis on Perceptions of Biology Teachers Based on Gender*

| Gender | N | Mean | Std. Dev. | *t* | *df* | *P* | Remark |
|---|---|---|---|---|---|---|---|
| Male | 339 | 157.11 | 13.36 | 2.78 | 718 | 0.006 | Significant |
| Female | 381 | 154.18 | 14.79 | | | | |

Summary of the Major Findings

The perceptions of Biology teachers on the application of transformative curriculum reform to instruction were significantly different based on their gender. This result was in favour of male Biology teachers;

Discussion

This study sought to find out the senior school biology teachers' perceptions on the application of transformative curriculum reform to instruction in Kwara State, Nigeria. Two research questions were formulated and one hypothesis was raised and tested. The research questions was answered using mean and standard deviation to determine Biology teachers' perceptions of transformative curriculum reform to instruction. Hypotheses 1 was tested using the t-test statistics.The result on the analysis of the perceptions of Biology teachers on application of transformative curriculum reform to instruction based on gender showed that there was a significant difference in the perceptions of Biology teachers based on gender. The male Biology teachers had more positive perceptions on the application of curriculum reform to instruction than their female counterparts, this shows that male Biology teachers can easily apply this reform to classroom instruction than their female

counterparts. The reason alluded to this finding is that Biology is a practical-oriented subject as a result of that; the male teachers devote more time in teaching it. It could also be that male biology teachers prefer biology teaching because they feel that it acquaints them with the wealth of knowledge in different areas of life.

The outcome of this study is in line with the study of Ahmed *et al* (2017) who carried out a study on senior secondary school Biology teachers' perception of their academic needs based on gender. The findings revealed a significant difference between the perception of Biology teachers on their academic needs based on gender and that male Biology teachers want more of academic needs than their female counterparts but her findings was in favour of female biology teachers. Also, this present study agreed with the findings of Odogwu et al(2011) who examined gender differences amongst science, mathematics and technology teachers with regards to the school environment.

**Conclusion**

The study established that senior secondary school biology teachers demonstrated a generally high perception of transformative curriculum reform as it applies to classroom instruction. However, contrary to what might be expected in a uniformly structured teaching environment, gender was found to significantly influence teachers' perceptions of the application of transformative curriculum reform in instructional practice. This implies that while overall acceptance of curriculum reform is strong among biology teachers, variations in perception exist along gender lines, suggesting that curriculum implementation is not entirely uniform across teacher categories.

**Recommendations**

1. **Ministry of Education (State and Federal level)**
   The Ministry of Education, through its curriculum implementation and teacher development units, should institutionalise targeted continuous professional development programmes that explicitly address transformative curriculum reform. These programmes should be structured in a way that ensures equal participation and relevance for both male and female biology teachers, with periodic monitoring of impact on classroom practice.
2. **Science Teachers Association of Nigeria (STAN)**
   The Science Teachers Association of Nigeria should take a more active role in bridging knowledge gaps by organising gender-responsive workshops and subject-specific training sessions on transformative curriculum practices. This will help standardise understanding and reduce perception gaps among biology teachers.
3. **Curriculum Developers (NERDC and allied bodies)**
   The Nigerian Educational Research and Development Council should strengthen its post-implementation feedback mechanism by engaging biology teachers directly in curriculum review sessions. This will ensure that transformative curriculum reforms are not only designed centrally but are also informed by classroom realities.
4. **School Administrators (Principals and Education Zonal Offices)**
   School-level leadership should ensure

equitable access to training opportunities for both male and female biology teachers. In addition, instructional supervision should be strengthened to ensure that curriculum reform principles are consistently applied in classroom practice rather than remaining theoretical.

5. **Research Extension** Future studies should expand the scope to include other categories of science teachers and tertiary institutions, particularly Colleges of Education and Universities, to provide comparative insight into how transformative curriculum reforms are perceived across different levels of the education system.

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