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INFLUENCE OF SCHOOL TYPE ON SENIOR SECONDARY SCHOOL STUDENTS' PERCEPTIONS OF CURRICULUM CONTENT RELEVANCE FOR STEM CAREER ASPIRATIONS IN OSUN STATE, NIGERIA

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Abstract

The study investigated the influence of school type on senior secondary school students' perception of curriculum content relevance for STEM (science, technology, engineering and mathematics) career aspirations in Osun State, Nigeria. The study adopted descriptive survey research design of correlational type. The population of the study comprised all senior secondary school students in public and private schools in Osun State. Multi-stage sampling procedure was used to select the sample for the study. In the State, two Local Government Areas (LGAs) were selected from each of the three senatorial districts using simple random sampling technique. From the selected LGA, two schools were randomly selected using simple random sampling technique. From each selected school, 40 students in senior secondary class two (SSSII) were selected using simple random sampling technique to take part in

the study. A total of 480 students (240 students from public schools and 240 students from private schools) participated in the study. Data were collected using an adapted and validated questionnaire with a reliability coefficient of 0.87. The questionnaire was tagged "Curriculum Relevance for STEM Scale" (CRSS). Data collected were analysed using percentage,mean, independent t-test and linear regression analysis. Results of the studyshowed that private school students perceived their STEM curriculum as being significantly more relevant to STEM career aspirations than public school students($t = 5.32$, $p < .001$). Furthermore, school type was shown to be a significant predictor ($\beta = .34$, $p < .001$) of perceived relevance to students, accounting for 28% of the variance. These results indicated that the way the resources are allocated, the different approaches to pedagogy, and how the curriculum is implemented across the various school types greatly influence how students perceive the relevance of their STEM education. The study concluded that school type is a major significant factor to STEM career aspirations among secondary school students in Osun State. It is suggested that curriculum reform and investment in resources specifically targeting public schools will assist in providing equity in STEM education.

Keywords: School Type, Curriculum Relevance, STEM Education.

Introduction

In a time of rapid technological growth and unstable economies, it is important that our students have the skills to be successful in a STEM (science, technology, engineering and mathematics). Their success will help ensure national development (World Bank, 2019) and fulfill Sustainable Development Goals (SDGs) both nationally and globally. Nigeria has a large youth population and urgent need to align its educational output with global needs in a 21st century knowledge economy (Adekunle & Ogunleye, 2022). At the secondary school level in Nigeria, STEM subjects are included in the school curriculum, and there are theory components regarding STEM education. However, the perceptions that students have about the curriculum content contribute significantly to their motivations to

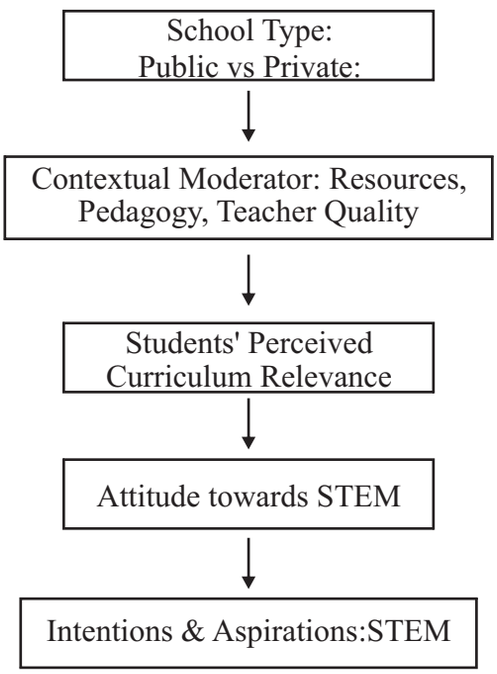
use it for career choice and skills development (Ajayi&Ogunyemi, 2015).

Curriculum relevance refers to students' perception of how well academic subject matter is connected with their personal interests, future job paths, and real-world experiences (Stuckey, et al., 2013). A strong relationship exists between high perceived curriculum relevance and increased levels of motivation for learning, deeper levels of learning about STEM areas, and greater desire to participate in STEM fields (Maltese & Tai, 2011). There is significant research that identifies the disparities between public and private schools in sub-Saharan Africa in relation to their academic performance and available resources (Oketch et al., 2010). Private schools in Nigeria typically have smaller classes, more qualified teachers, and better-equipped laboratories, resulting in a more practical, student-centred learning environment (Owoeye & Yara, 2011). Public schools, however, face challenges such as overcrowded classrooms, a lack of resources, and a rigid focus on examination-prompted teaching (Adesoji & Ibe, 2018).

There have been little researches that inform about how the type of school a student attends factors into their perception of the curriculum. Within Osun State in Nigeria and throughout the country, there is a clear separation between public and private schools as they relate to funding, facilities, teacher qualifications, and pedagogical freedom (Adesoji & Ibe, 2018). The education provided by private schools is viewed as "better"; however, there is limited empirical data on how school type significantly affects students' perceptions of the curriculum regarding relevance for STEM.

This study is based on the Theory of Planned Behaviour. According to Ajzen, 1991, the theory posits that perceptions will lead to attitudes, which will in turn shape behavioural intentions (i.e., to pursue a STEM-related career). The type of school could influence perceptions through the learning setting; therefore, type of school couldserve as a contextual moderator.

Figure 1: Conceptual Framework for the Current Study



In Nigeria, secondary education plays a major role in shaping students' academic trajectories and career decisions. Despite policy emphasis on STEM education, enrolment and retention in STEM career pathways remain relatively low (Aina & Oloyede, 2022). Furthermore, youth unemployment continues to create a significant national challenge, underscoring the need to cultivate future career pathways early in the education pipeline.

Osun State provides a relevant context for examining these issues, as secondary school curricula are usually characterized by examination-driven instruction with limited emphasis on practical relevance. Understanding how curriculum content relevance influences STEM career aspirations among senior secondary school students is therefore essential for informing curriculum reform and policy development.

Statement of Research Problem

Despite the recognized importance of STEM for both national and global development,there has been concern that Osun State senior secondary school curriculum may not adequately prepare students for STEM careers in their public and private schools. This study thereforeseek to address the inherent potentially of inadequacy in curriculum content which could lead to low STEM career aspirations among secondary school students and the perceived curriculum relevance and the influence of school type on STEM career aspirations.

Objectives of the Study

The specific objectives of the study are to:

(i) assess the level of public/private school students' perceptions of the curriculum content relevance for career aspirations in STEM; and

(ii) examine the relationship between school type and students' overall perceptions of curriculum content relevance for STEM.

Research Questions

(a) Are there significant differences in public/private school students' perceptions of the curriculum content relevance for career aspirations in STEM?

(b) What is the relationship between school type and students' overall perceptions of curriculum content relevancy for STEM?

Hypothesis

There is no significant influence of school type on students' overall perceptions of curriculum content relevance for career aspirations in STEM.

Methodology

The study adopted the descriptive survey research design of correlational type. The population of the study comprised all Senior Secondary School (SSS II) students in Osun State. Multi-stage

sampling procedure was employed to select the sample for the study. In the State, two Local Government Areas (LGAs) was selected from each of the three senatorial districts in the State using simple random sampling technique. From each LGA, two schools (one public and one private) were selected using simple random sampling technique. From each selected school, 40 students were also randomly selected using simple random sampling technique. In all, six LGAs and twelve senior secondary schools (six public and six private) were randomly selected and used for the study. A total of 480 students in both public and private schools participated in the study. Data were collected using an adapted and validated questionnaire with a reliability coefficient of 0.87. The questionnaire was tagged "Curriculum Relevance for STEM Scale" (CRSS).The CRSS consisted of 3 sections: Section A consisted of the Demographic data of the students sampled; Section B included a Perceived Relevance for STEM Careers with 12 items (Alpha = .89); andSection C included one open-ended item providing qualitative data.

The Rating Scale provided by the CRSS consisted of a 5-point Likert Scale from 1 to 5 (1= Strongly Disagree and 5= Strongly Agree). The validity of the instrument was established by three experts, and the CRSS was pilot tested. Data were analysed using version 26 of SPSS. Demographic data were summarised using descriptive statistics (as the central measure) and research questions were tested using Independent Samples T-Test and multiple regression analysis.The consent of the principals of the selected schools was obtained by the researcher before the commencement of data collection to schedule visit to the school for the conduct of the research study. During each visit, the study's purpose was explained to participating students in the presence of a class teacher, emphasizing voluntary participation, anonymity, and the right to withdraw. Written informed assent was obtained from students and passive consent was confirmed through parental information sheets distributed a week prior. The self-administered questionnaire was completed under supervision in a classroom setting, with an average completion time of 25 minutes. Researchers were present to clarify questions without influencing

responses. A total of 500 questionnaires were distributed; 20 were discarded due to significant incompleteness, yielding 480 valid responses for analysis (96% response rate).

Results

Demographic Characteristics of Respondents

Table 1: Demographic Distribution of Respondents (N=480)

Variable	Category	Public (n=240)	Private (n=240)	Total
Gender	Male	122 (50.8%)	118 (49.2%)	40 (50%)
	Female	118 (49.2%)	22 (50.8%)	240 (50%)
Age	15-16 years	158 (65.8%)	142 (59.2%)	300 (62.5%)
	17-18 years	82 (34.2%)	98 (40.8%)	180 (37.5%)
Parental STEM-Related		45 (18.8%)	89 (37.1%)	134 (27.9%)
Occupation	Non-STEM	195 (81.2%)	151 (62.9%)	346 (72.1%)

Difference in Perceptions Based on School Type

Table 2: Independent Samples t-test Results for Perceived Relevance

Construct	School Type	Mean (M)	Std. Dev. (SD)	t-value	df	p-value
STEM Career	Public	3.12	0.78	5.32	478	<.001
Relevance	Private	3.85	0.69			

Predictive Ability of School Types

Measured with a simple linear regression to predict the perceptions of total relevance based on school type (Public=0; Private=1), the regression model was significant ($F(1, 478) = 65.43$; $P < 0.001$), and accounted for 28% of the variance (R.28). The standardized coefficient (B) was 0.34 ($P < 0.001$); meaning the amount of variance explained has a moderate effect.

The initial research findings show reliability and normality in our analyses of the curriculum relevance of The Curriculum Relevance for STEM Scale (CRSS). For the entire participant pool, a strong internal consistency was verified through the use of the Cronbach's alpha: .89 for STEM career relevance, and .91 overall. Data screening showed that the skewness and kurtosis for all major constructs returned to an acceptable range of ±1.0, thereby meeting the assumption of normality for parametric analytical purposes. Levene's test showed that homogeneity of variances were met during the t-test

analyses with p > .05. Participants received a mean score of 3.39 (SD = 0.82) for perceived curriculum relevance, which demonstrates a moderately positive perception.

Table 3: Detailed Independent Samples t-test Analysis of Perceptions by Type of School

Construct & Sample Items	School Type	N	Mean (M)	Std. Dev. (SD)	Std. Error Mean	Mean Diff.	t (478)	p-value	Cohen's d
STEM Career Relevance	Public	240	3.12	0.78	0.050	0.735	.32	<.001	0.68
	Private	240	3.85	0.69	0.045				

Interpretation: The results of the t-tests indicated substantial differences at a statistically significant level. The substantial size of the effect as reported by Cohen (1988) would suggest that there are large effect sizes (>0.6). Thus, the disparate perceptions of these two groups of students exist at a statistically significant level and at a practically large level.

Regression Analysis

A simple linear regression was performed to assess the predictive power of school type on the overall perception of curriculum relevance (combined score).

Table 4: Simple Linear Regression Summary:
School Type Predicting Overall Perceived Relevance

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	F Change	Sig. F Change
1	.53	.28	.28	0.69	65.43	<.001

Coefficient	Predictor	Unstd. B	Std. Error	Standardized Beta (β)	t	p-value	95% CI for B
	(Constant)	3.12	0.045		69.33	<.001	[3.03, 3.21]
	School Type (Private)	0.73	0.090	.34	8.09	<.001	[0.55, 0.91]

Interpretation: The regression analysis showed that the model was significant ($F(1, 478) = 65.43$, $p < .001$). The model explains 28% ($R^2 = .28$) of the total variance in students' perceptions of the relevance of the curriculum based on school type (public/private). The standardized beta coefficient ($\beta = .34$, $p < .001$) indicates that there is a moderate positive prediction between being a private school student and perceiving the curriculum as more relevant than their public school counterparts.

Reliability & Normality

The internal consistency of the Curriculum Relevance for STEM

Scale (CRSS) was confirmed with the entire sample and had excellent levels of Cronbach's alpha: .89 for the STEM Career Relevance subscale, and .91 for the overall scale. Results from screening for data show that skewness and kurtosis values are less than the acceptable criteria of ± 1.0 for all major constructs indicating that the assumption of normality for parametric analysis has been met. Levene's test also confirmed that there is homogeneity of variances ($p > .05$) for each of the t-tests conducted.

Descriptive and Inferential Statistics

In addition to demographic information in Table 1, the average response to perceived curriculum relevance for all respondents was 3.39 (SD = 0.82) on the 5 point scale demonstrating that respondents generally view that they have moderate to strong perceptions about the relevance of the curriculum. Table 3 shows independent samples t-tests conducted to compare respondent perceptions based upon school type.

Supplementary Qualitative Insights.

The qualitative aspects of the study included analyses of open-ended survey responses.

When public school children were asked what they enjoyed most about their experience in school, the students consistently provided the following quotes that indicated certain constraints that they experience with regard to hands-on learning experiences: "We do not do experiments in the lab; all we do is read about them in science textbooks." (Student from public school 3).

On the contrary, children from private schools commented on the value of experiential learning opportunities as evidenced by the following quotes: "In Physics we built a model bridge that was then judged by an engineer." (student from private school 2).

Discussion of Findings

Results indicate statistically significant differences in student perceptions of overall instructional relevance; students attending a Private school perceived that their curriculum was more relevant in

preparing them for STEM career pathways. The findings are consistent with previous studies conducted by Owoeye and Yara (2011) that attribute these differences to more effective instructional resources and innovative instructional strategies employed by Private Schools.

In addition, the effective hands-on, experiential learning activities that can take place in the more resource-rich Private schools likely make the conceptualization of how to apply abstract STEM concepts easier (Lackéus, 2020).The amount of variance in the perception of instructional relevance explained by school type (28%) indicates that the context of the institution will greatly shape an individual's attitude towards the educational environment. It is necessary to recognize that the overall educational ecosystem (the physical environment of the school, teacher preparation/training, and epistemological freedoms) is just as critical as the actual curriculum presented when determining the overall relevance of a school's curriculum.

Qualitative data from the open-ended responses provided additional insight into their utility as a determinant; for example, Public students frequently identify "theoretical teaching" and "not having labs."

The study findings provide evidence of the influence that school type has on the perceptions of public and private school students related to the importance of staying connected to the STEM Community and keeping up to date with advancing Technology.

Study limitations included that the study was conducted in one state; therefore, the results may not directly translate to the actual career outcomes of the participants. Additionally, self-reporting bias is a limitation.

Declaration of Interest: The authors have no competing interests.

Funding: No specific funding was received for this research from any private, public or nom-profit agency.

Data Availability: The data supporting the findings of this study can

be obtained from the primary author of this study upon request.

Conclusion

The findings of this study show that the type of school is a significant factor determining the level of relevance of student perceptions of their curriculum in terms of future careers in STEM (science, technology, engineering & math), to be of relevance to them. The systematic advantages of utilizing the private school system provide a more conducive environment for developing these types of student perceptions.

To each school, students in SSSII completed surveys in accordance with approved ethical guidelines. Returned, anonymous, self-reported surveys were entered into a spreadsheet for analysis. Statistical software, SPSS (Version 28), was used to analyze and compare mean scores for degree of agreement with statements made within the survey as well as explore the correlation between degree of agreement for statements made within the survey and type of school (public vs. private)..

Section 1 of the Results section presents the statistical differences found between students in public and private schools with regard to the curriculum-based perceptions of the importance of staying connected to the STEM community as well as keeping up to date with scientific advancements. In Section 1 of the Results, statement-by-statement comparisons were also made to demonstrate any impact that school type had on the differences found between public and private schools. Section 2 of the Results section is a summary of the mean scores of the degree to which students' in public and private schools agreed with each of the statements being compared. In Section 3 of the Results, a summary of the number of students in public and private schools that listed STEM/Science Career Choices of Interest, as well as a summary of the career choices of Business Owner for public and private school students,' is provided.

In conclusion**,** school type plays an important role in how students perceive that the curriculum they are receiving in Osun State will prepare them for the future career related to STEM. School type

provides systemic advantages that allow for educators within Private schools to provide students with a greater relevance to the curriculum that they are being presented with.

Recommendations:

Based on findings of the study, the following are recommended:

1. Policy-makers such as state and federal Ministry of Education should create a "STEM Resource Equalization Fund" that allocates funding towards upgrading public schools' laboratories, libraries, and digital infrastructure.
2. Curriculum planners should include mandatory practical and project-based learning (PBL) components that focus on addressing local problems to further enhance relevance.
3. Teacher training should receive continuous professional development in the areas of context-based pedagogy.
4. Further researches should be conducted in the future to track employees' actual career choices and examine the effective pedagogical methodology and its impact on perceptions regarding STEM.

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