Predicting students' multidimensional learning outcomes in public secondary schools: The roles of school facilities, administrative expenses and curriculum

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Abstract

Previous research has assessed school facilities, administrative expenditures and curriculum and their relative contributions to students' cognitive learning outcomes. This suggested the need to investigate further how these predictors may impact students' affective and psychomotor outcomes. The current research studied the combined and relative prediction of school facilities, administrative expenses and curriculum on students' overall cognitive, affective and psychomotor learning outcomes in public secondary schools. A cross-sectional research design was employed in this study, involving 87 school administrators and a randomly selected group of 915 senior secondary class II (SS2) students. For data collection, we utilised the School Inputs Questionnaire (SIQ) and Educational Outcomes Questionnaire (EOQ), both developed by the researchers and validated through expert assessments, including content validity, Exploratory Factor Analysis (EFA) for dimensionality, Confirmatory Factor Analysis (CFA) for goodness of fit, and reliability using Cronbach's alpha. The results of these assessments demonstrated acceptable outcomes aligned with international standards. Hierarchical regression analysis was conducted to analyse the collected data. The findings indicated that enhancing the provision of quality school facilities, administrative expenses, and school curricula improved students' overall cognitive, affective, and psychomotor learning outcomes. Specifically, administrative expenses and school curriculum had significant predictive power for students' overall cognitive, affective, and psychomotor learning outcomes. However, while school facilities significantly predicted students' overall, affective, and psychomotor dimensions, they did not significantly predict the cognitive dimension. These findings offer valuable insights for policymakers and educators aiming to enhance the educational quality in public secondary schools.

Introduction

Students' learning outcomes refer to the knowledge, skills, attitudes, and values students acquire due to their education. These outcomes are important because they impact students' ability to succeed in school and their future careers and reflect the education system's effectiveness. Learning outcomes are measured by the quality of students' cognitive, affective, and psychomotor skills after exposure to lesson contents and experiences in the short- or long-term (Ekpenyong et al., 2022; Owan et al., 2022). Cognitive learning outcomes refer to students' knowledge, understanding, and intellectual development from their educational experiences. These can include understanding and recalling information, solving problems, analysing and synthesising information, applying knowledge to new situations, and thinking critically and creatively (Ali, 2013; Bassey & Owan, 2020). The measure of cognitive skills follows Bloom's taxonomy of educational objectives, including "knowledge", "comprehension", "application", "analysis", "synthesis", and "evaluation" (Bloom et al., 1956). These have, however, been revised to "remember", "understand", "apply", "analyse", "evaluate", and "create" (Anderson & Krathwohl, 2001; Krathwohl, 2002). Cognitive learning outcomes are often measured through tests and may be assessed at the individual, class, school, or district levels (Ekpenyong et al., 2022).

Affective outcomes refer to students' personality, social and emotional traits, as well as their behaviour, morals and values. It can be measured using constructs such as self-concept, motivation, study habits, respect for rules and regulations, and positive attitudes towards learning, others, and the world around them (Almlund et al., 2011; Lipnevich et al., 2013). Affective learning outcomes are often more difficult to measure than cognitive learning outcomes, as they involve changes in students' attitudes and emotions rather than their knowledge or skills (Anderson & Bourke, 2013; Levin, 2012). However, they are no less important, as students' attitudes and emotions can significantly impact their learning and overall wellbeing (Ekpenyong et al., 2022; Owan et al., 2022). These affective attributes predict students' school learning behaviour and determine their societal adjustment. Thus, a key educational outcome must be attained for the functionality of society at large.

Similarly, the psychomotor learning outcomes measure how students have acquired functional skills in schools to adapt and function in a dynamic society. The psychomotor skills of the students are commonly referred to as the physical or vocational abilities normally developed during practical activities in schools (Zhao & Hong, 2012). When students acquire basic vocational skills in school, they become functional and useful in society and can take up menial employment for self-reliance (Nathan et al., 2017). Individuals who excel academically, possess a strong aptitude for learning and have admirable personal qualities are considered excellent students and valuable assets to society (Olaitan, 2017). This implies that adequate assessment of goal attainment in secondary schools should go beyond measuring students' cognitive attainment to capturing their affective attributes and psychomotor skills (Bassey et al., 2019; Ekpenyong et al., 2022, 2023; Owan et al., 2022).

In the last two decades, studies on students' learning outcomes in Nigeria, just as with most African or developing countries, have continually lamented over the quality of students produced from the secondary education system (e.g., Ajayi & Yusuf, 2010; Arop et al., 2018; Odigwe et al., 2018). Some scholars have complained that Nigeria's laudable secondary education goals are not maximally attained due to an increased number of youths without functional skills (Suleiman, 2018; Ololube et al., 2016) and a high rate of social upheaval among Nigerian youths (Adelaja & George, 2020). Others have pointed to students' low scores on standardised and teacher-made tests (Eze, 2021; Owan & Ekpenyong, 2022; Ugwuanyi et al., 2020), high rate of indiscipline (Gcelu et al., 2020) and moral decadence (Sanga, 2022) as indicators of poor learning outcomes in African countries. Despite the laudable secondary education policies in Nigeria, many youths are still idle, do not live usefully in society, are not able to transit into institutions of higher learning, and lack any sense of self-worth or regard for the opinions and emotions of others (Pastore, 2019; Robert & Owan, 2019; Watson et al., 2016). Thus only a few per cent of the students can gain access to tertiary institutions every year (Herbaut & Geven, 2020; Ilie & Rose, 2016) due to their high rate of involvement in examination malpractices (Agwu et al., 2022; Okolie et al., 2019; Owan et al., 2023). These observed inadequacies point to the fact that secondary schools, which are supposed to prepare students for functional living through acquiring the right skills, values, and learning and boosting their dispositions for higher learning, have not attained their goals.

Many factors can influence students' learning outcomes. Some of these factors are internal to the student, such as their innate ability, health status, social capital (Owan et al., 2022), motivation (Baber, 2020), self-regulation (Shing & Rameli, 2020), and prior knowledge (Alabdulkarem et al., 2021). Other factors are external to the student and include the quality of teaching (Belsito, 2016; Robert & Owan, 2019), teachers' pedagogic service discharge (Ngware & Mutisya, 2022; Owan et al., 2022), the curriculum (Kazima et al., 2022; Peterson & Mlynarczyk, 2016), and the learning environment (Matthews & Mercer-Mapstone, 2018), among others. In this paper, the emphasis is on school inputs as predictors of students' learning outcomes. School inputs are all the factors or characteristics available in schools that can influence the entire education production process. These include infrastructural provisions, student-teacher ratio, administrative expenses, funding, classroom time utilisation rates, class size, and school curriculum (Nghambi, 2015). Although these school inputs have since been identified as crucial for students' learning outcomes, the degree of such a relationship has rarely been investigated in Cross River State, Nigeria. This creates a knowledge gap since it remains unclear the degree to which school inputs predict students' learning outcomes across the cognitive, affective and psychomotor dimensions of learning outcomes. Previous studies on school inputs have mostly assessed the contribution of individual inputs to students' cognitive outcomes, ignoring the affective and psychomotor dimensions. In the present study, we used three specific variables (school facilities, administrative expenses, and school curriculum) as proxies for school inputs. The next section reviews previous studies on each specific input about students' learning outcomes in

secondary schools.

Studies on school facilities

In the last decade, a large body of research has focused on analysing the role that school facilities play in the education of students. Previous research has attempted to analyse the extent to which different types of school facilities are available (Akah et al., 2022; Nurabadi et al., 2020; Owan & Owan, 2022), adequate (Ademiluyi, 2019; Alabi, 2021), functional, accessible (Islam et al., 2020; Oluwalola, 2021), and utilised (Bervell & Arkorful, 2020) for teaching and learning. These studies have revealed different degrees of resource availability in secondary schools. For instance, some studies discovered a low extent in the availability and adequacy of school resources (Lawanson & Gede, 2011; Takwate, 2018). On the contrary, other studies have found a great extent in the availability of diverse resources for teaching and learning after the COVID-19 pandemic (Akah et al., 2022; Owan & Owan, 2022), with public schools revealed as having more facilities than private (Arshad et al., 2020). The low availability of facilities recorded in some studies and the high availability recorded in others may be due to the undersupply, optimum supply and oversupply of school materials resources.

It has been shown that over- and under-provision of resources or inequitable distribution of materials to schools result in the waste of school material resources (Mbon et al., 2020). Nevertheless, the disparity in the results of previous studies regarding the availability status of school facilities creates an evidence gap. It is a sign that further research is necessary for more clarification. Besides, most studies did not consider the role school facilities played in the educational outcomes of learners in secondary schools. Bridging this gap, however, other researchers have linked the availability of school facilities to students' motivation (Sidi, 2019) and learning outcomes (Arshad et al., 2018; Takwate, 2018). It has been proven that the availability and layout of school physical facilities can promote students' learning outcomes (Ariani, 2015; Daramola et al., 2017). Other researchers have argued that the mere availability of facilities does not promote learning outcomes, as some study suggests; instead, they proved that teachers' utilisation of available resources has a nexus with students' learning outcomes (Akah et al., 2022; Issacar & Hesbon, 2021; Owan & Ekpenyong, 2022).

Similarly, the functionality of school facilities has been linked to students' learning outcomes in secondary schools (Dube, 2019). Although different terms and phrases have been used to mean learning outcomes in most previous studies, one issue is common among them. Most studies have treated students' learning outcomes as a unidimensional construct by focusing too much on the cognitive domain of Bloom's taxonomy (Bassey et al., 2019; Ekpenyong et al., 2022; Owan et al., 2022). It has been argued that how well a child learns is reflected in the cognitive, affective and psychomotor attributes (Akhiruyanto et al., 2022; Orak et al., 2020; Robert & Owan, 2019). Therefore, any measurement of students' learning outcomes must consider the three domains of learning (cognitive, affective and psychomotor) to be considered adequate (Ekpenyong et al., 2022; Owan et al., 2022).

The few studies that have assessed students' learning outcomes from the three domains of Bloom's taxonomy did not focus on school facilities as the predictor. Their foci were on variables such as chemistry laboratory curriculum (Enneking et al., 2019), students' variables (Owan et al., 2022), instructional videos (Cooper & Higgins, 2015), teachers and administrators' inputs (Ekpenyong et al., 2022), and quality assurance practices (Bassey et al., 2019) among others. The existing gap in the literature was the driving force behind the present study.

Studies on administrative expenses

Administrative expenses are overhead expenditures that educational managers make in the day-to-day running of the school. These expenditures depend on how much income the school has available (Odigwe & Owan, 2022). Therefore, the government's national expenditure in funding the education system is important for local expenses at the institutional level (Ekaette et al., 2019; Odigwe & Owan, 2019). Other sources of funds for administrative expenses are internal revenue generation (Mbah & Onuora, 2018; Odigwe, 2020) and alternative funding (Onyeche, 2018). Despite the importance of internal funding and expenditure, the literature has been silent on school managers' administrative expenses. Previous studies on administrative expenditures over the last decade have focused on government ministries, agencies and other parastatals (e.g., Chernew & Mintz, 2021; Cunha, 2018). Other studies have assessed administrative expenses as a criterion variable responding to different predictors in the context of corporate firms, non-governmental and banking organisations (Fan & Liu, 2017; Venieris et al., 2015).

In the education sector, most studies have focused on school leaders' budgeting (Sinclair & Malen, 2021), accountability (Keddie & Holloway, 2020; Paletta et al., 2020; Wang et al., 2022), cost-sharing (Alazmi & Al-Kubaisi, 2020; Hayes & Burkett, 2021), internal revenue generation (Mbah & Onuora, 2018; Odigwe, 2020; Onyeche, 2018) fund management (Aliyu, 2018; Odigwe & Owan, 2022; Owan et al., 2021), and resource procurement practices (Buys et al., 2020; Prabhakar et al., 2022) and other related constructs. Although some of these variables are tied to administrative expenses in one or the other (for example, resource procurement), the extent to which principals' day-to-day expenditure predicts students' outcomes was not the focus of the cited studies.

Admittedly, studies have documented that school spending was associated with students' academic achievement (Hægeland et al., 2012; Nicoletti & Rabe, 2018). The importance of instructional expenses for achieving high student test results in any educational system was also emphasised (Webber, 2012). Similarly, it was shown that rural students' academic performance is positively correlated with the amount of money spent on their education and the number of years they spend in school (Munda & Odebero, 2014). A study has also shown that increased school funding was associated with increased administrative expenses, students' discipline, attendance and academic success (Huntoon, 2021). A case was also presented by the finding

of Gigliotti and Sorensen (2018) that sustained financial investment in schools was crucial for districts to maintain quality public education. Even though school financing and administrative expenditures are important predictors of students' learning outcomes (Bruce et al., 2019; Strickland, 2021), the link is known for the cognitive aspect of students' learning outcomes. There seems to be no existing study connecting principals' administrative expenses to students' affective and psychomotor learning outcomes. Based on this gap, the present study assessed how principals' administrative expenses predict secondary school students' affective, cognitive and psychomotor learning outcomes.

Studies on the school curriculum

The curriculum is a structured plan of education developed by schools or other organisations to help learners gain a deeper understanding and mastery of the material. It is designed to improve their abilities and contribute to society's overall wellbeing (Megbo & Saka, 2015). In a study, Demir et al. (2012) revealed that students acquired efficient studying skills through the curriculum for increased academic achievements. It has been discovered that students exposed to a new science curriculum improved their analytic ability, processing capacity and other skills, such as reading, mathematics and communication, than those taught using the traditional curriculum (Alghamdi, 2017; Shymansky et al., 1983). Furthermore, students' achievement levels in both coordinate and synthetic geometry improved after exposure to quality curriculum contents compared to students in the control group (Senk, 2020).

Different studies have linked the different dimensions of students' school achievement to the school curriculum. For instance, it was discovered that students' academic and social skills were enhanced as they could communicate, organise their ideas, share information and express opinions due to improvements in the curriculum contents and experiences (Alismail & McGuire, 2015). Again, in China, it was found that the new curriculum used in schools changed students' attitudes and led to more positive views of the government (Cantoni et al., 2017). In the same direction, research in South Africa indicated a direct association between the curriculum implemented and students' success in the schools (Dhunpath & Subbaye, 2018). The correlation between school-based curriculum and students' academic achievement was moderated by factors such as students' ability, the quality of school resources, internal and external support for schools and the quality of the curriculum arrangement process (Wiyono, 2018). Also, when exposed to an improved school curriculum, students showed higher learning achievements and higher motivation to learn science using digital technologies (Alnajjar, 2022). This implies that the school curriculum affected students' academic performance and psychomotor and affective skills.

However, the study conducted by Ni et al. (2011) found mixed results when studying the effectiveness of the school curriculum in improving students' performance in all three areas of learning. The cited authors found that implementing a quality school curriculum improved the cognitive performance of all the students and their psychomotor attributes (such as routine problem-solving and complex problem-solving skills), and it improved the affective attributes of learners. However, another research provided contrary findings that the curriculum only improved students' achievement scores of cognitive ability but not their post-school affective (such as the behaviour of the students in society) and psychomotor (functional skills for employment) outcomes (Bouck & Joshi, 2012).

Several scholars have attempted to link the school curriculum to student achievement. Only a handful of these studies have attempted to relate the quality of the school curriculum to the three domains. In fact, in some cases, studies focus on one domain per time, with just a few addressing the three concurrently (Bouck & Joshi, 2012; Ni et al., 2011). Among the studies that capture the three learning domains relative to the school curriculum, there also seem to be disagreements on how strongly the two variables are related, the direction of the relationship, and the importance of the correlation. This situation creates an evidence gap since the findings in the literature are inconclusive and warrant further studies to clarify the ongoing debate. Also, a cursory look at the literature further shows a decline in recent studies, making the area seem neglected. Moreover, limited literature on curriculum development and its impact on students' learning outcomes in Nigeria across the cognitive, affective, and psychomotor domains has created a knowledge gap. Due to the gap, it is yet to be known whether the school curriculum has a role to play in deciding how students think (cognitive), behave (affective) and showcase their skills (psychomotor). However, conducting studies in these areas is important to improve the curriculum's effectiveness and enhance students' learning outcomes. Based on this identified gap, the present study also examined how the curriculum predicts secondary school students' affective, cognitive and psychomotor learning outcomes.

Theoretical and conceptual frameworks

This study is grounded in the Input-Process-Output (IPO) model of education production. The IPO model is widely used in educational research and provides a conceptual framework for understanding the relationships between inputs, processes, and outputs. In the IPO model, inputs refer to the resources and factors that influence the learning process (Decius et al., 2021; Huang et al., 2021). School facilities, administrative expenses, and curriculum can be considered as inputs that impact students' learning outcomes. These inputs provide the foundation for the teaching and learning processes within the educational setting (Ekpenyong et al., 2022, 2023; Owan et al., 2022).

Processes represent the instructional activities, teaching methods, and interactions between teachers and students that occur within the learning environment (Chen et al., 2022; Wong et al., 2022). The inputs influence these processes and play a critical role in shaping students' learning outcomes (Decius et al., 2021). In this case, output is students' learning outcomes, including cognitive, affective, and psychomotor dimensions. The outputs are the result of the interactions between the inputs and the teaching and learning processes (Ekpenyong et al., 2023; Owan & Ekpenyong, 2022; Robert

& Owan, 2019).

In the current study, the IPO model was useful in understanding how school facilities, administrative expenses, and curriculum can influence the teaching and learning processes and subsequently impact students' learning outcomes. It provides a theoretical framework to examine the relationships between these variables and offers insights into the mechanisms through which inputs affect outputs. Although the process (teaching and learning) was not measured nor examined in the current, the state of the output (students' learning outcomes) across the three dimensions offers insight into the process. Based on this theoretical underpinning, the conceptual model of this study was developed, as shown in Figure 1.
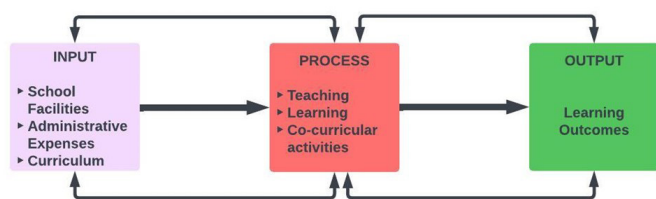

Figure 1: Conceptual model of the study.

Research question

The primary research question that underly this study is: What are the relative and composite contributions of school facilities, administrative expenses and curriculum to students' overall cognitive, affective and psychomotor learning outcomes in public secondary schools?

Hypothesis

The hypothesis tested in this study is as follows:

Ho: There are no significant relative and composite contributions of school facilities, administrative expenses and curriculum to students' overall cognitive, affective and psychomotor learning outcomes in public secondary schools.

H1: There are significant relative and composite contributions of school facilities, administrative expenses and curriculum to students' overall cognitive, affective and psychomotor learning outcomes in public secondary schools.

Methods

Research design

The study adopted the quantitative research method, drawing from the positivist research philosophy. The use of quantitative research involves the collection and analysis of numerical data to examine relationships, patterns, and statistical significance. This approach provides objective and empirical evidence to support or reject hypotheses and research questions. Positivism is a philosophical stance that uses scientific methods to understand and explain the social world (Tamminen & Poucher, 2020). Positivists believe that knowledge can be gained through systematic observation and measurement, and they seek to establish causal relationships between variables (Zyphur & Pierides, 2020). The research design adopted for this study was the cross-sectional research design. A key feature of cross-sectional studies is the observation of variables in a single moment (Zangirolami-Raimundo et al., 2018). This design was deemed appropriate for this study because the researchers concentrated on SS2 students as the unit of measurement for learning outcomes since school facilities, administrative expenses, and curriculum also affect them. Secondly, the design allowed for estimating the contributions of all the explanatory variables on the criterion variables based on data collected at a time point.

Study participants

Both secondary school administrators (N= 87) and senior secondary class II (SS2) students (N = 53,255; males = 26,206; females = 27,047) constituted the targeted population for this research. 915 SS2 students were randomly selected using a multistage selection technique, while principals were not sampled since their population was manageable (More details about the sampling process can be found in (Ekpenyong et al., 2022, 2023; Owan et al., 2022). For students' demographics, 44.1% are males, while 55.9% are females. For age, 48.9% of the students are between 10 and 20 years, while 51.1% are 21 or older. Regarding socioeconomic status (SES), 50.5% of the students are from families with a high SES, while 48.2% are from families with a low SESs. Conversely, 51.8% of students came from broken families, while the remaining 48.2% were from families with intact structures. Again, 47.2% of the students are members of small families, while 52.8% are members of large families. For principals, 50.7% were males, while 49.3% were females; 3.8% were Nigeria Certificate in Education (NCE) or Ordinary National Diploma (OND) holders, 79.9% were Higher National Diploma (HND) or First Degree holders, 13.9% were Master's degree holders, and 2.4% were doctorate holders. Regarding years of work experience, 25.7% had 0 to 10 years of experience, 22.6% had 11 to 20 years of experience, 24.8% had 21 to 30 years of experience, and 26.8% had 31 years of experience or higher.

Measures

The study has three independent variables: school facilities, administrative expenses, and curriculum. School facilities refer to the physical resources and infrastructure available in schools. It encompasses various aspects such as classrooms, libraries, laboratories, computer facilities, sports facilities, and other amenities. The study aimed to understand how the provision and quality of these resources influence students' learning outcomes across different dimensions. Administrative expenses pertain to the financial resources allocated and utilised by school administrators for the management and operation of the educational institution. It encompasses budgeting, expenditure on administrative functions, financial planning, resource allocation, and

fund management. The study investigated how the prudent utilisation of administrative expenses impacts students' learning outcomes. The curriculum serves as a framework for educational instruction and encompasses the content, pedagogical approaches, learning objectives, and assessment methods employed in schools. The study examined the design, content, and implementation of the curriculum. It aimed to understand how the curriculum influences students' overall, cognitive, affective, and psychomotor learning outcomes. These independent variables were selected based on their potential influence on students' learning outcomes.

The dependent variable in the study is students' learning outcomes. Specifically, the study examined students' overall, cognitive, affective, and psychomotor learning outcomes as the dependent variables. Overall learning outcomes refer to the comprehensive assessment of students' learning achievements across various domains. It encompasses the cognitive, affective, and psychomotor dimensions of learning. Cognitive learning outcome is the dimension of learning outcomes related to developing students' intellectual abilities, knowledge acquisition, critical thinking skills, problem-solving skills, and academic achievements. Affective learning outcomes pertain to students' emotional and attitudinal development, including their motivation, engagement, attitudes towards learning, and social-emotional skills. Psychomotor learning outcomes refer to developing students' physical and motor skills, coordination, dexterity, and ability to perform practical tasks.

Instrumentation

This research included two data collection devices: the School Inputs Questionnaire (SIQ) and the Educational Outcomes Questionnaire (EOQ). The researchers created new instruments because none already existed that had suitable psychometric properties for measuring the variables of this study. The items in both instruments were based on previous studies (e.g., Bassey et al., 2019; Lili et al., 2018; Odigwe, 2020; Robert & Owan, 2019), theories/models (such as "human capital development theory" by Schultz, 1961; "contemporaneous educational production model by Coleman et al. (1966) and ideas from consulted field experts. Based on principals' perspectives, the SIQ was designed to measure school facilities, curriculum and administrative expenses. The EOQ was designed to assess students' affective and psychomotor learning outcomes and was administered to the SS2 students. On the other hand, cognitive learning outcome was measured using the average sessional results of the students, which were expressed as percentage estimates of their scores. The SIQ and EOQ instruments utilised a six-point Likert scale, ranging from Very Strongly Agree (VSA) to Very Strongly Disagree (VSD), to capture the participants' responses. The choice of a six-point Likert scale was based on the unique nature of the measured variables. The SIQ consisted of 21 items, while the EOQ comprised 30 items.

Validity and reliability

The draft copy of the research instrument underwent a thorough review process by a panel of experts to assess its face and content validity. The panel included two experts specialising in the Economics of Education, two experts in Measurement and Evaluation, and one expert in Educational Psychology from the University of Calabar. Additionally, the quantitative validity of the instrument was evaluated by a group of ten experts, consisting of four experts in Measurement and Evaluation and six experts in Educational Management. These experts were asked to rate the relevance and clarity of the items related to the measured domains using a 1-4 scale, where higher scores indicated greater relevance or clarity. The ratings were used to calculate the instrument's Content Validity Index (CVI).

The Content Validity Index (CVI) for the SIQ was assessed at both the item and scale levels. The item-level CVI scores for relevance and clarity of the SIQ ranged from 0.8 to 1 and 0.9 to 1, respectively. The scale-level CVI scores for relevance and clarity of the SIQ were 0.98 and 0.98, respectively. Similarly, the item-level and scale-level CVIs for the EOQ were evaluated, with relevance scores ranging from 0.9 to 1 and clarity scores ranging from 0.8 to 1. The scale-level CVI scores for relevance and clarity of the EOQ were 0.99 and 0.98, respectively. It is important to note that different researchers have established standards for revising, dropping, and retaining items, and for validation by ten experts, the acceptable CVI threshold typically falls within the range of 0.78 to 0.83. Since all the item-level CVIs (I-CVIs) and scale-level CVIs (S-CVIs) in this study were within this range, the instrument can be considered valid.

Additionally, a pilot test was conducted involving 110 school leaders, 50 principals and 60 vice principals, and 412 SS2 students from non-participating schools. This pilot test aimed to assess the dimensionality and factorial validity of the research instruments. The Cronbach alpha approach was employed to evaluate the instruments' reliability. The results of this test indicated that the internal consistency reliability coefficients of the items in the SIQ ranged from .77 to .90. In contrast, those of the EOQ ranged from .71 to .90. Further details regarding these findings can be found in the results section of the study.

Procedure for data collection and analysis

The researchers, along with the assistance of four trained research assistants, physically administered the instruments to the participants. Prior permission was obtained from the school leaders, including principals and vice principals, who were provided with a clear explanation of the research purpose. A letter requesting their consent for participation in the study was given to all respondents. Participants who were willing to participate were encouraged to respond sincerely to the items in the instruments. The instruments were then distributed to the selected school leaders and students involved in the study. The respondents were given three days to complete and return the questionnaires. The researchers and research assistants visited the schools again to collect the completed copies of the instruments. Only

the questionnaire copies that were properly filled out and retrieved were utilised for data analysis in the study.

The items in each questionnaire were categorised based on the specific research variables they were designed to measure. A scoring system was established for both instruments, ranging from 6 to 1 for positively worded items, while negatively worded items were reverse scored. A coding schedule was developed to guide the scoring and coding of responses, which were then entered into a spreadsheet using a spreadsheet package. The scores for each respondent on the respective sub-scales were summed and recorded in the research project's prepared spreadsheet. As for the assessment of cognitive learning outcomes, the average sessional results of each student per school were used, and these average scores were entered in the appropriate column of the spreadsheet. Descriptive statistics were employed to analyse the demographic data of the respondents. However, to address the research question and test the previously stated hypothesis, multiple hierarchical linear regression analysis was conducted.

Results

Exploratory Factor Analysis (EFA)

The dimensionality and structure of the instruments were analysed using Principal Axis Factoring (PAF). During the extraction process, the Promax rotation method was applied. Factors were selected based on Eigenvalues greater than 1, and items with loadings below .40 were eliminated. The correlation matrix determinant value for the School Input Questionnaire (SIQ) exceeded the criterion value of .00001, indicating the absence of multicollinearity among the items in the matrix. However, one problematic item (SI18) was identified, which loaded exclusively onto factor 4 and did not correlate with any other item. After removing this item, the PAF was rerun using the same parameters. The results revealed that three factors accounted for 51.19% of the total variance in the data. The sample size of 110 school leaders was considered adequate for factor analysis, as indicated by a Kaiser-Meyer-Olkin (KMO) measure of .83. The Bartlett's test of sphericity, which assesses the correlation between variables, was significant at the .05 level with a Chi-Square value of 834.69 and 153 degrees of freedom, indicating that the variables were not redundant (Owan et al., 2021). The three factors were retained as they aligned with the study's theoretical framework. The pattern matrix was also examined to illustrate the relationship between each item and the latent factors (see Table 1).

The dimensionality test of the Educational Outcomes Questionnaire (EOQ) was also based on principal axis factoring. The complete EFA procedure for this questionnaire and its results can be found in two already published works from this project (see Ekpenyong et al., 2022; Owan et al., 2022).

Table 1: Factor Analysis of the School Input Questionnaire (SIQ) Structure.

Factor	Label	Items	X̄	SD	Factor loadings EFA	Factor loadings CFA
1	School facilities (Variance explained: 20.48%; Cronbach Alpha reliability: .90)	SI6	3.69	1.76	.82	.81
		SI9	3.75	1.68	.78	.77
		SI5	3.83	1.65	.78	.76
		SI7	3.60	1.64	.76	.77
		SI8	3.58	1.68	.76	.77
		SI4	3.42	1.68	.76	.76
2	School Curriculum (Variance explained: 18.25%; Cronbach Alpha reliability: .87)	SI21	3.24	1.71	.79	.79
		SI22	3.40	1.75	.78	.79
		SI19	3.35	1.66	.76	.75
		SI16	3.28	1.75	.69	.70
		SI20	3.44	1.73	.69	.69
		SI17	3.38	1.71	.69	.68
3	Administrative Expenses (Variance explained: 12.46%; Cronbach Alpha reliability: .77)	SI13	3.79	1.74	.68	.67
		SI12	3.60	1.70	.64	.63
		SI10	3.54	1.66	.64	.65
		SI15	3.52	1.81	.61	.60
		SI11	3.52	1.79	.53	.55
		SI14	3.58	1.77	.52	.53
	Instrument Total	Kaiser-Meyer-Olkin (KMO) = .83				
		Bartlett's Test of Sphericity at 153 df = 834.69, p < .05				
		Cronbach Alpha = .77				
		Corr. Det. Matrix = .000				

Confirmatory Factor Analysis

The confirmatory factor analysis (CFA) was performed using the Maximum Likelihood (ML) estimation technique to assess the measurement capability of the items in capturing their respective latent constructs. This CFA confirmed the findings from the earlier exploratory factor analysis (EFA) conducted and provided additional validation. Table 1 presents the CFA and EFA results, while Figure 2 depicts the CFA model for the School Input Questionnaire (SIQ). The CFA model for the EOQ can be referenced from two previous works by Ekpenyong et al. (2022) and Owan et al. (2022).
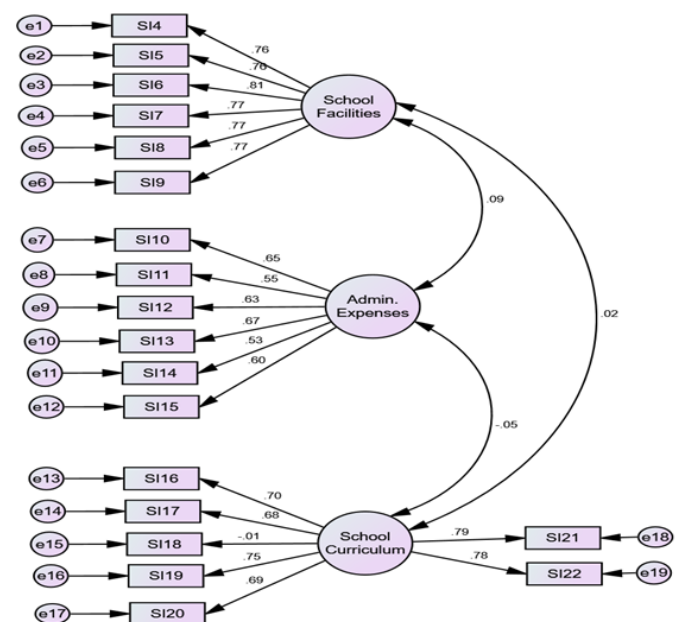

Figure 2: Standardised Latent-Trait CFA Model of the School Input Questionnaire (SIQ).

Eight fit indices were utilised to establish the adequacy of the CFA model and determine its acceptance. These include "Chi-Square", "Comparative Fit Index" (CFI), "Goodness of Fit Index" (GFI), "HOELTER's Critical N", "Incremental Fit Index" (IFI), "Normed Fit Index" (NFI), "Relative Fit Index" (RFI), "Root Mean Square Error of Approximation" (RMSEA), and "Tucker-Lewis Index" (TLI). The specific details about each of these indices are already documented in the literature (see Brown, 2015; Hooper et al., 2008; Hu & Bentler, 1999; Owan et al.,

2021). Multiple fit indices were employed to compensate for each index's complementary strengths and weaknesses, in line with instrument validation research recommendations. For example, Kline (2005) suggested utilising a minimum of four fit indices (χ2, RMSEA, CFI, and SRMR) to determine the acceptance of a CFA model.

Assessing the goodness of fit information reveals that the SIQ model met the criteria for Chi-Square (χ2 = 144.69, df = 149, p = .59 > .05), IFI (1.00 > .95), TLI (1.00 > .95), CFI (1.00 > .95) and RMSEA (.00 < .08) but did not meet the GFI (.88 < .95), NFI (.84 < .95) and RFI criteria (.82 < .05). However, the model was retained as it met the criteria of most of the fit indices. Besides, the GF1, NFI and RFI values were all approaching 1.00, and values closer to 1.00 have been suggested to indicate a good fit (Hooper et al., 2008). The EOQ met almost all the criteria except the Chi-Square criteria. More information about the EOQ model can be found in the two published reports (Ekpenyong et al., 2022; Owan et al., 2022). All models generally met the requirements of at least four assessment indices. The TLI and CFI supported earlier research findings as less vulnerable to sample size concerns. These justifications and the fact that all retained items had acceptable factor loadings led to the acceptance of both models. The instruments were deemed suitable for data collection—not only for this study but also for future researchers.

Relative and composite contributions to students' learning outcomes

The findings in Table 2 demonstrate the impact of different factors on students' overall learning outcomes. In the initial model, school facilities accounted for 21% of the variance in students' learning outcomes. However, when administrative expenses were introduced in model 2, the contribution of school inputs increased to 30%, resulting in a significant R2 change of 9%. In model 3, the contribution of the school curriculum was added to that of model 2, further raising the contribution of school inputs to 37%, with an additional R2 change of 7%. This indicates that school facilities contributed 21%, administrative expenses contributed 9%, and the school curriculum contributed 7% to the overall variance in students' learning outcomes. Collectively, these three predictors explain 37% of the variance in students' overall learning outcomes in secondary schools. However, it is important to note that 63% of the variance remains unexplained and may be attributed to other variables not considered in this study. Among the predictors, school facilities had the most significant impact on students' overall learning outcomes (ΔF [1, 868] = 230.15, p < .05), followed by administrative expenses (ΔF [1, 867] = 105.62, p < .05), and the school curriculum (ΔF [1, 866] = 95.39, p < .05).

Table 2 reveals the contributions of different factors to students' cognitive learning outcomes. In the first model, school facilities accounted for 21% of the variance in cognitive outcomes. When administrative expenses were introduced in model 2, the contribution of school inputs increased by 9%, resulting in a total contribution of 29%. Model 3 included the school curriculum, which brought about a 6% change, raising the composite contribution of

school inputs to 36% from the 29% recorded in model 2. This indicates that school facilities, administrative expenses, and the curriculum contributed 21%, 9%, and 6%, respectively, to students' cognitive learning outcomes. Furthermore, Table 2 demonstrates that the composite contribution of the three predictors (school inputs) to the total variance in cognitive learning outcomes was 36%, leaving 64% of the variance unaccounted for and attributable to other variables not considered in model 3. Among the predictors, school facilities had the most significant impact on students' cognitive learning outcomes (ΔF [1, 868] = 226.13, p < .05), followed by administrative expenses (ΔF [1, 867] = 104.43, p < .05), and the school curriculum (ΔF [1, 866] = 94.19, p < .05).

Regarding affective learning outcomes, according to Table 2, school facilities accounted for 27% of the variance in students' outcomes in model 1. With the introduction of administrative expenses in model 2, there was a 9% change, leading to a total contribution of 36% from the initial 27%. In model 3, including the school curriculum resulted in an 8% change, bringing the composite contribution of the three predictors to 44% from the 36% recorded in model 2. Therefore, school facilities, administrative expenses, and the curriculum contributed 27%, 9%, and 8%, respectively, to students' affective learning outcomes. Furthermore, Table 2 indicates that the composite contribution of the three predictors (school inputs) to the total variance in affective learning outcomes was 44%. In contrast, the remaining 56% of the variance was unaccounted for and attributable to other predictors not included in model 3. Among the predictors, school facilities had the highest predictive power for students' affective learning outcomes (ΔF [1, 868] = 321.63, p < .05), followed by administrative expenses (ΔF [1, 867] = 127.50, p < .05), and the school curriculum (ΔF [1, 866] = 120.33, p < .05).

In terms of psychomotor learning outcomes, as presented in Table 2, school facilities accounted for 27% of the variance in model 1. With the inclusion of administrative expenses in model 2, there was a 10% increase, resulting in a total contribution of 37% from the initial 27%. In model 3, adding the school curriculum led to a 7% shift, raising the composite contribution of the three predictors to 44% from the 37% recorded in model 2. Therefore, school facilities, administrative expenses, and the curriculum contributed 27%, 10%, and 7%, respectively, to students' psychomotor learning outcomes. Furthermore, Table 2 indicates that the composite contribution of the three predictors (school inputs) to the total variance in psychomotor learning outcomes was 44%, while the remaining 56% was unaccounted for and attributed to factors not included in model 3. Among the predictors, school facilities had the highest predictive power for students' psychomotor learning outcomes (ΔF [1, 868] = 318.95, p < .05), followed by administrative expenses (ΔF [1, 867] = 134.54, p < .05), and the school curriculum (ΔF [1, 866] = 114.84, p < .05).

Table 2: Hierarchical regression analysis of the relative prediction of school facilities, administrative expenses and curriculum on students' learning outcomes.

Criterion variables	Model	R	R^2	Adj. R^2	SE	ΔR^2	ΔF	df_1	df_2	$p\Delta F$
Overall	1	.46ª	.21	.21	182.65	.21	230.15	1	868	.000
Learning	2	.54ᵇ	.30	.29	172.55	.09	105.62	1	867	.000
Outcomes	3	.60ᶜ	.37	.36	163.86	.07	95.39	1	866	.000
Cognitive	1	.46ª	.21	.21	175.47	.21	226.13	1	868	.000
Learning	2	.54ᵇ	.29	.29	165.87	.09	104.43	1	867	.000
Outcomes	3	.60ᶜ	.36	.36	157.61	.07	94.19	1	866	.000
Affective	1	.52ª	.27	.27	4.65	.27	321.63	1	868	.000
Learning	2	.60ᵇ	.36	.36	4.34	.09	127.50	1	867	.000
Outcomes	3	.66ᶜ	.44	.44	4.07	.08	120.33	1	866	.000
Psychomotor	1	.52ª	.27	.27	2.74	.27	318.95	1	868	.000
Learning	2	.61ᵇ	.37	.37	2.55	.10	134.54	1	867	.000
Outcomes	3	.66ᶜ	.44	.44	2.40	.07	114.84	1	866	.000

a Predictors: (Constant), School facilities
b Predictors (Constant): School facilities, administrative expenses
c Predictors (Constant): School facilities, administrative expenses, School curriculum

Hypothesis testing: Composite contributions

The ANOVA results, as presented in Table 3, were utilised to test the hypothesis of this study at a significance level of .05. It is revealed that school facilities made a significant contribution to students' overall learning outcomes in model 1, with $F(1, 868) = 230.15$, $p < .05$. In model 2, there was a significant composite contribution of school facilities and administrative expenses to students' overall learning outcomes, with $F(2, 867) = 181.76$, $p < .05$. Similarly, in model 3, a significant composite contribution of school facilities, administrative expenses, and school curriculum to students' overall learning outcomes was observed, with $F(3, 866) = 166.16$, $p < .05$. These results provide partial support for the alternative hypothesis, indicating that the predictors have a significant impact on students' overall learning outcomes. Conversely, the null hypothesis is rejected concerning the composite contribution of the three predictors to students' overall learning outcomes.

According to Table 3, significant contributions were observed concerning students' cognitive learning outcomes. In model 1, school facilities made a significant contribution, with $F(1, 868) = 226.13$, $p < .05$. Model 2 indicated a significant composite contribution of school facilities and administrative expenses to students' cognitive learning outcomes, with $F(2, 867) = 178.75$, $p < .05$. Furthermore, in model 3, a significant composite contribution of school facilities, administrative expenses, and school curriculum to students' cognitive learning outcomes was observed, with $F(3, 866) = 163.37$, $p < .05$. As a result, the null hypothesis, which pertained to the composite contribution of the three predictors on students' cognitive learning outcomes, was rejected. Conversely, the alternative hypothesis was supported, suggesting that these predictors significantly influence students' cognitive learning outcomes.

According to Table 3, the contribution of school facilities to students' affective learning outcomes was found to be statistically significant in model 1, with $F(1, 868) = 321.63$, $p < .05$. In model 2, the composite contribution of school facilities and administrative expenses to students' affective learning outcomes was also significant, with $F(2, 867) = 248.00$, $p < .05$. Similarly, in model 3, the composite contribution of school facilities, administrative expenses, and school curriculum to students' affective learning outcomes was significant, with $F(3, 866) = 228.20$, $p < .05$. Based

on the evidence presented in Table 3, the null hypothesis was rejected, which presumably suggested no significant contribution of the three predictors to students' affective learning outcomes. Instead, the alternative hypothesis was supported, indicating a significant contribution of these three predictors to students' affective learning outcomes.

According to Table 3, the contribution of school facilities to students' psychomotor learning outcomes in model 1 was found to be statistically significant, with $F(1, 868) = 318.95$, $p < .05$. In model 2, the composite contribution of school facilities and administrative expenses to students' psychomotor learning outcomes was also statistically significant, with $F(2, 867) = 251.00$, $p < .05$. Furthermore, in model 3, the composite contribution of school facilities, administrative expenses, and school curriculum to students' psychomotor learning outcomes was found to be statistically significant, with $F(2, 867) = 227.00$, $p < .05$. Based on the results presented in Table 3, the null hypothesis, suggesting no significant contribution of the three predictors to students' psychomotor learning outcomes, was rejected. Conversely, the alternative hypothesis was supported, which proposed a significant composite contribution of school facilities, administrative expenses, and school curriculum to students' psychomotor learning outcomes.

Table 3: ANOVA results of hierarchical regression analysis on the composite prediction of school facilities, administrative expenses and curriculum on students' learning outcomes.

Criterion variable	Model	Source	SS	Df	MS	F	P
Overall learning outcomes	1	Regression	7678024	1	7678024	230.15	.00ᵇ
		Residual	28956775	868	33360.34		
		Total	36634799	869			
	2	Regression	10822445	2	5411223	181.76	.00ᶜ
		Residual	25812353	867	29772.03		
		Total	36634799	869			
	3	Regression	13383631	3	4461210	166.16	.00ᵈ
		Residual	23251167	866	26848.92		
		Total	36634799	869			
Cognitive skills	1	Regression	6962332	1	6962332	226.13	.00ᵇ
		Residual	26725221	868	30789.43		
		Total	33687552	869			
	2	Regression	9835343	2	4917672	178.75	.00ᶜ
		Residual	23852209	867	27511.2		
		Total	33687552	869			
	3	Regression	12175183	3	4058394	163.37	.00ᵈ
		Residual	21512370	866	24841.07		
		Total	33687552	869			
Non-Cognitive skills	1	Regression	6951.83	1	6951.83	321.63	.00ᵇ
		Residual	18761.08	868	21.614		
		Total	25712.91	869			
	2	Regression	9357.102	2	4678.551	248.00	.00ᶜ
		Residual	16355.81	867	18.865		
		Total	25712.91	869			
	3	Regression	11352.48	3	3784.161	228.20	.00ᵈ
		Residual	14360.42	866	16.582		
		Total	25712.91	869			
Practical skills	1	Regression	2389.589	1	2389.589	318.947	.00ᵇ
		Residual	6503.153	868	7.492		
		Total	8892.741	869			
	2	Regression	3263.181	2	1631.59	251.279	.00ᶜ
		Residual	5629.561	867	6.493		
		Total	8892.741	869			
	3	Regression	3922.329	3	1307.443	227.797	.00ᵈ
		Residual	4970.413	866	5.74		
		Total	8892.741	869			

b Predictors (Constant): School facilities
c Predictors (Constant): School facilities, administrative expenses
d Predictors (Constant): School facilities, administrative expenses, School curriculum

Hypothesis testing: Relative contributions

According to Table 4, school facilities, administrative expenses, and curriculum individually contributed significantly to students' overall cognitive, affective, and psychomotor learning outcomes. However, in model 3, the relative contribution of school facilities to students' cognitive learning outcomes was insignificant. As a result, the alternative hypothesis was supported, indicating that school facilities have a significant relative contribution to students'

overall affective and psychomotor learning outcomes. On the other hand, the null hypothesis regarding the relative contribution of administrative expenses and school curriculum to students' overall cognitive, affective, and psychomotor learning outcomes was rejected. This suggests that both administrative expenses and school curriculum have significant relative contributions to students' overall, affective, and psychomotor learning outcomes. However, it's important to note that the null hypothesis was not rejected for the relative contribution of school facilities to students' cognitive learning outcomes, indicating that the impact of school facilities on cognitive learning outcomes may not be statistically significant.

Table 4: Specific prediction of school facilities, administrative expenses and curriculum on students' learning outcomes.

Criterion variables	Models	Predictors	β	t	SE	p
Students' Overall Learning Outcomes	1	School facilities	.46	15.17	2.65	.00
	2	School facilities	.19	4.83	3.41	.00
		Administrative expenses	.40	10.28	3.24	.00
	3	School facilities	.08	1.97	3.39	.05
		Administrative expenses	.20	4.84	3.50	.00
		School curriculum	.39	9.77	2.98	.00
Cognitive Learning Outcomes	1	School facilities	.46	15.04	2.55	.00
	2	School facilities	.19	4.76	3.28	.00
		Administrative expenses	.40	10.22	3.12	.00
	3	School facilities	.07	1.91	3.26	.06
		Administrative expenses	.20	4.81	3.37	.00
		School curriculum	.39	9.71	2.86	.00
Affective Learning Outcomes	1	School facilities	.52	17.93	0.07	.00
	2	School facilities	.24	6.45	0.09	.00
		Administrative expenses	.42	11.29	0.08	.00
	3	School facilities	.12	3.32	0.08	.00
		Administrative expenses	.21	5.34	0.09	.00
		School curriculum	.41	10.97	0.07	.00
Psychomotor Learning Outcomes	1	School facilities	.52	17.86	0.04	.00
	2	School facilities	.23	6.23	0.05	.00
		Administrative expenses	.43	11.60	0.05	.00
	3	School facilities	.11	3.16	0.05	.00
		Administrative expenses	.23	5.72	0.05	.00
		School curriculum	.40	10.72	0.04	.00

Discussion

This study quantified the degree to which school facilities, administrative expenses, and curriculum cumulatively and relatively predict students' overall cognitive, affective and psychomotor learning outcomes in public secondary schools. The results showed that improving the combined provision of quality school facilities, administrative expenses, and curriculum predicts students' overall learning outcomes. The result aligns with earlier studies that the availability and layout of school physical facilities can promote students' learning outcomes (Ariani, 2015; Daramola et al., 2017). Furthermore, the study corroborates earlier evidence that school spending was associated with students' academic achievement (Hægeland et al., 2012; Nicoletti & Rabe, 2018). The result also strengthens the findings of Demir et al. (2012) that the school curriculum is important for increasing students' learning efficiency and achievement. This result is crucial for school administrators looking to promote secondary education goal attainment through the overall development of students for progression towards higher education, good living, and economic advancement.

The study also found that factors such as the quality of school facilities, administrative expenses, and the school curriculum content significantly affect students' cognitive learning outcomes in public secondary schools. This result suggests that the quality of school facilities, the cost of administrative expenses, and the content of the school

curriculum all play important roles in deciding how secondary school students can meaningfully think, comprehend, apply, analyse, synthesise and evaluate information. This result agrees with other studies (e.g., Munda & Odebero, 2014; Webber, 2012) that documented a significant positive correlation between educational expenditure and students' academic achievement. Furthermore, another study found significant improvement in students' cognitive outcomes due to exposure to quality curriculum content compared to control group students (Senk, 2020). This may be of interest to educators, policymakers, and others who are concerned with improving the academic performance and outcomes of students in secondary schools. It is also useful for finding areas where improvements can be made to better support students' learning and development.

The results showed a strong, combined positive prediction of school facilities, administrative expenses, and curriculum on students' affective learning outcomes in public secondary schools. This result suggests that students in schools with good facilities, prudent administrative expenditures, and a well-designed curriculum are likely to have better affective learning outcomes (such as increased motivation, engagement, and enjoyment of learning) compared to those in schools with poorer facilities and wasteful administrative expenditures, and a poorly designed curriculum. This result is not surprising since the effective provision of school facilities, proper management of school funds, and curriculum development can be useful in shaping students' values, characters, attitudes and behaviours. The finding agrees with some earlier studies that the availability of school facilities is related to students' motivation (Sidi, 2019) and learning outcomes (Arshad et al., 2018; Takwate, 2018). The findings of this study also align with an earlier study which documents an important link between administrative expenditures and students' learning outcomes (Strickland, 2021). Moreover, an earlier study also documented that school curricula changed students' attitudes (Cantoni et al., 2017). The implications of these findings are relevant for educational stakeholders to invest more in supplying school facilities and curriculum development. The results can also be useful for school principals to minimise the misuse and wastage of school funds.

This study also revealed that school facilities, administrative expenses and curriculum cumulatively predict students' psychomotor learning outcomes in public secondary schools. This finding implies that secondary students in schools with adequate facilities, reasonable administrative expenses and quality curricula tend to buy more skills and develop competencies for perception, adaptation, origination, creation and innovation than their school counterparts without such provisions. The result is explainable since schools with better facilities, lower administrative expenses, and more effective curricula may successfully promote practical teaching and learning. This result supports an earlier study (Ni et al., 2011) that discovered that implementing the school curriculum improved students' cognitive and psychomotor attributes, such as routine and complex problem-solving skills. The result also strengthens the findings of earlier studies in China (Cantoni et al., 2017) and South Africa (Dhunpath & Subbaye, 2018).

In terms of individual contributions, this study revealed that school facilities significantly predicted students' overall, affective and psychomotor learning outcomes. However, school facilities did not significantly predict the cognitive dimension of learning outcomes in public secondary schools. This result implies that students who learn in better facilities are more engaged and motivated, leading to better affective and psychomotor learning outcomes. On the other hand, the quality of school facilities may not be as important for cognitive learning outcomes, which may depend more on other factors such as teaching effectiveness, curriculum quality, and students' cognitive abilities and prior knowledge. This result agrees with other studies that how well a child has learnt is reflected in their cognitive, affective and psychomotor abilities (Akhiruyanto et al., 2022; Orak et al., 2020; Robert & Owan, 2019). Similarly, other researchers found an important link between the availability of school facilities and students' motivation (Sidi, 2019). Nevertheless, further research is needed to understand why school facilities do not significantly predict students' cognitive learning outcomes.

It was also proved that administrative expenses significantly predicted students' learning outcomes holistically and across all dimensions. Thus, higher administrative expenses are related to better learning outcomes for students in public secondary schools. This relationship extends to multiple dimensions of learning outcomes, including cognitive (related to knowledge and understanding), affective (related to emotions and attitudes), and psychomotor (related to physical skills and movements). This evidence supports a long list of studies (e.g., Hægeland et al., 2012; Munda & Odebero, 2014; Nicoletti & Rabe, 2018; Webber, 2012) reporting a substantial correlation between administrative expenditures and students' learning outcomes. It is not uncommon for research to find that certain factors, such as resources and funding, can significantly impact student learning outcomes. In this case, administrative expenses may play a particularly important role. It is worth noting that the nature and extent of this relationship may vary depending on the specific context in which the research was conducted.

Further research may be needed to understand the mechanisms behind this relationship fully. One potential implication of these findings is that schools and educational institutions may want to consider increasing prudent expenditure of school finances and minimising waste to improve students' learning outcomes. This agrees with the findings of Mbon et al. (2020) that the wastage of school resources was associated with poor school effectiveness in promoting teaching and learning.

Lastly, this study documented a significant positive prediction of school curriculum on students' overall cognitive, affective and psychomotor learning outcomes in public secondary schools. This suggests that the curriculum used in these schools is effective in helping students learn and achieve positive outcomes in various areas. The result aligns with an earlier study that reported improvements in students' academic and social skills due to improvements in the curriculum contents and experiences (Alismail & McGuire, 2015). Other studies also reported that students showed higher learning achievements and motivation to learn when

exposed to an improved school curriculum (Alnajjar, 2022; Bouck & Joshi, 2012; Ni et al., 2011). Overall, the findings of this study highlight the importance of having a well-designed and effective curriculum in promoting positive learning outcomes for students. This is especially important in public secondary schools, as these schools serve a diverse population and play a critical role in preparing students for higher education and the workforce. It would be interesting to explore further the specific aspects of the curriculum that contributed to the positive learning outcomes observed in this study, as well as to examine the potential long-term effects of this curriculum on students' academic and professional success.

Constraints and direction for future research

There are several limitations to this study. First, the study was conducted in public secondary schools, so the results may not be generalisable to other types of schools, such as private or primary schools. Therefore, conducting a similar study in different types of schools, such as private or primary schools, will be important to determine if the findings can be generalised to these settings. Second, the study only looked at the prediction of these factors on learning outcomes and did not assess their actual causal relationship. Future studies may consider using experimental or quasi-experimental designs to assess the causal relationship between the predictor variables and students' learning outcomes. Third, the study was conducted in a specific geographic location in Nigeria, so the results may not apply to other regions with different education systems or socio-cultural contexts. Future researchers should consider expanding their scope to other geographic locations to address this limitation and see if the results hold up in different education systems and socio-cultural contexts. Finally, the study was cross-sectional, so whether the observed relationships between the predictor variables and learning outcomes are consistent over time is unclear. Therefore, future longitudinal studies need to be conducted to assess the stability of the relationships between predictor variables and learning outcomes over time.

Conclusion

This study aimed to examine the combined and individual impact of school facilities, administrative expenses, and school curriculum on students' overall cognitive, affective, and psychomotor learning outcomes in public secondary schools. The study's findings provide compelling evidence that these factors play a significant role in shaping students' educational achievements. The results indicate that school facilities significantly contribute to students' overall affective and psychomotor learning outcomes. Additionally, administrative expenses significantly influence students' overall cognitive, affective, and psychomotor learning outcomes. Furthermore, the school curriculum significantly predicts students' overall cognitive, affective, and psychomotor learning outcomes. These findings hold considerable implications for policymakers, educators, and researchers in the field of education. Policymakers can utilise these findings to prioritise investments in school facilities

and promote efficient allocation of administrative expenses, leading to improved student learning outcomes. Educators are encouraged to recognise the impact of these factors and optimise school facilities and resources to maximise student achievement. The study emphasises the importance of investing in high-quality school facilities, managing administrative expenses effectively, and implementing a comprehensive curriculum to enhance learning outcomes in public secondary schools. Overall, this study provides valuable insights for educators and policymakers striving to enhance the quality of education in public secondary schools. It also highlights the need for further research to deepen our understanding of the relationship between these factors and student learning outcomes, facilitating the identification of best practices and evidence-based approaches for enhancing student achievement.

Based on the conclusion of this study, it is recommended that school administrators and education authorities should allocate resources and oversee the enhancement of school facilities, including classrooms, libraries, laboratories, and recreational spaces. They should create a conducive learning environment that supports students' overall cognitive, affective, and psychomotor learning outcomes. School administrators and financial managers should thoroughly review administrative expenses to identify inefficiency and reduce unnecessary costs. Resources should be allocated to educational initiatives, student support services, and teacher professional development opportunities. Curriculum development committees and Education Authorities should be responsible for reviewing and updating the school curriculum to ensure it is comprehensive, well-rounded, and aligned with educational standards. The curriculum should incorporate practical and experiential learning activities, critical thinking exercises, and relevant teaching materials to enhance students' overall cognitive, affective, and psychomotor learning outcomes. Teacher training institutions and departments should provide regular professional development opportunities for teachers to enhance their teaching skills and subject knowledge. The focus should be on strategies that promote effective instructional practices, student engagement, and differentiation to improve students' overall cognitive, affective, and psychomotor learning outcomes. Schools, community organisations, and stakeholders should foster collaborative partnerships to support students' learning outcomes. Schools should collaborate with policymakers, parents, and community organisations to provide additional resources, mentorship programs, and extracurricular activities that promote students' holistic development.

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