AN INVESTIGATION INTO THE IMPACT OF SENIOR SECONDARY SCHOOL PHYSICS TEACHERS' WORKLOAD ON STUDENTS' ACADEMIC PERFORMANCE.

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Abstract

This paper explored the impact of excessive Physics workload on students' academic performance. A descriptive survey design was employed. The population consisted of three hundred (300) Physics teachers, while the sample consisted of one-hundred and twenty (120) Physics teachers from four Area Councils in Abuja. A structured questionnaire was used to collect data. The instrument was validated by three (3) University lecturers from the Science Education Department of the Faculty of Education, University of Abuja and two (2) Senior Research Officers from the Nigeria Educational Research and Development Council (NERDC), Abuja. The instrument had a reliability index of 0.78 using cronbach Alpha technique. Two research questions were asked and answered and three hypothesis was put forward and tested at 0.05 level of significance. Mean and standard deviation were used to analyze the research questions. The results obtained from the analysis revealed that excess Physics workload has statistically negative correlation with students' academic performance, there was variation of excess workload across school type with public school teachers better equipped to manage excess Physics workload. It was recommended that Physics education should be better resource, Physics curriculum overload should be considered for reviewing among others. It is important for policymakers and school administrators to actively seek to reduce the excessive workload placed on teachers. By doing so, teachers will be better equipped to provide quality education to their students.

Keywords: Physics Education, Workload, Teachers, Secondary School. Environment

Introduction

The Sustainable Development Goals (SDGs) are a collection of 17 global goals adopted by the United Nations General Assembly in 2015. To create a better world by 2030, these goals aim to address various issues that impact society. In particular, SDG 4 focuses on quality education and aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." Unfortunately, a significant obstacle hindering progress towards this goal is the chronic shortage of teachers. To begin with, the demand for teachers continues to rise as populations grow and education systems around the world expand. However, the supply does not meet the demand, resulting in a significant gap. In fact, some countries are facing a shortage of thousands of teachers. This shortage affects both developed and developing countries.

According to the UNESCO Institute for Statistics (2020) report, Sub-Saharan Africa is in need of an additional 1.6 million teachers to ensure that every child has access to quality education. Similarly, the Arab states will have to expand their teaching force by 26% within the next ten years to achieve their education goals. Moreover, UNESCO's report suggests that there is a global need to recruit over 28 million teachers by the end of the next decade. However, the biggest challenge lies in Sub-Saharan Africa, where the teaching force must expand by 68% to meet education targets. In fact, Mozambique is one of the countries that have been hit the hardest by teacher shortages, with a pupil-teacher ratio (PTR) of 67.4:1. Furthermore, the report estimates that Sub-Saharan Africa must

increase the number of school teachers from 2.5 million to 3.7 million to fulfill the Education for All (EFA) commitment. This indicates a gap of 1.2 million teachers, with over half of them needed in West Africa alone.

Secondary education is an essential cornerstone that plays a crucial role in preparing students for higher education while also fostering the development of the nation. Furthermore, it sets the stage for further learning and equips individuals with the necessary knowledge and skills to contribute to the country's progress. In fact, the National Policy for Education (NPE) published in 2014 emphasizes the significance of secondary education as an instrument for national development. It's important to note that secondary education is much more than just an investment; it's a strategic tool that can be utilized to accelerate economic, social, political, technological, scientific, and cultural development. By providing equal access to education for all Nigerian children, regardless of their disabilities, secondary education promotes equality and enhances the worth and development of individuals.

However, the heightened poor achievement of students poses a significant challenge to the government's ability to achieve its objectives. This obstacle undermines the realization of the lofty goal, rendering it a mere optical illusion. According to Adeyemi (2020) the yearly dwindling of Nigerian senior secondary school students' achievement in external examinations such as the West African School Certificate Examinations (WASSCE) has been an issue of concern to all and sundry. Akpan (2020), stated clearly that attainment of high academic achievement by students have remained a subject of concern as there is significant gap in the relative attainment between students in different schools. An Editorial reported by the Sun Newspaper of 17th August ,2021 stated that results of May/ June West African Senior School Certificate Examination (WASSSCE) was yet another confirmation that secondary education in Nigeria is badly in need of intervention to improve students' academic performance due to the recurring mass failure in the critical examinations. Olorundare (2019) paints a gloomy picture of students' poor academic performance in a statement that:

> The 'hydra headed monster' of failure has taken over, unleashing its fury on students year after year. Besides, the harvest of academic failure has brought many students to their knees in tears. Every academic year, the nation is grieved by the below average performance of thousands of students in national examinations. The situation of poor performance has become so bad that the students fear examination bodies like a plague. For most students, the fear of examination bodies is the beginning of wisdom

To better understand why the performance of students is appalling, it is essential to look at two major contributing factors. First, the teacher's attitude towards their job is one of the primary causes of this problem. As noted by Alderman (2018) and Betts, Zau & Rice, (2021), teachers' poor attendance to lessons and absence from duty due to excessive workload have a significant impact on the delivery of effective lessons. Parallel to this, a non-conducive working environment can also have a significant impact on achieving desired goals, as highlighted by Obi's (2021) publication. Corroborating this assertion, Considine & Zappala's (2020) publication stresses the importance of a conducive working environment for effective teaching. According to authors, a conducive working

environment is critical for meeting the expectations of teachers who aim to deliver high-quality classroom instruction using contemporary pedagogies and skills.

The teachers' working environment, as observed by Considine & Zappala (2020, p.2), consists of various organizational structures that determine their formal positions within the school. These structures include lines of authority, workload, autonomy, and supervision. To create an environment conducive to effective teaching, it is essential to consider and optimize these factors. Teachers place great emphasis on the working environment as it has the potential to enhance their motivation to educate young and innocent learners. According to Graete (2021), every teacher has the opportunity to fulfill their role as an educator to the fullest extent by receiving appropriate professional development, working in a supportive environment, and receiving meaningful feedback. The importance of these factors cannot be overstated, as they contribute to the teachers' overall inspiration and effectiveness in the classroom. By creating an environment that fosters growth and provides the necessary support, teachers can thrive and make a significant impact on the lives of their students.

Graete (2021) highlights how the working environment of teachers can impact students. Teachers can provide individual attention to students, which is crucial for their development. However, secondary school teachers face challenges due to a lack of professional support, instructional resources, and human resources. To address this issue, teachers need access to adequate resources to create a more comfortable working environment. Improving teachers' working conditions can have a positive impact on students' academic performance. With access to necessary tools and support, teachers can deliver effective lessons and engage students. Moreover, having the necessary human resources, such as teaching assistants, can greatly benefit teachers. With the assistance of teaching assistants, teachers can focus more on individual student support, leading to improved learning outcomes. This is particularly important in sciences, particularly Physics, where the teachers require all the support available to create an engaging learning experience for their students.

Problem Statement

The workload for Physics teachers at SSS is usually overwhelming due to the shortage of Physics teachers in most schools (Ojo,2020). As a result, the few available teachers have to carry out multiple duties, which can be demotivating and stressful. This can lead to a feeling of low inspiration among Physics teachers, making them less willing to work in such an environment. Research studies have shown that teachers worldwide are expected to perform many tasks during their jobs. Physics teachers are often burdened with both instructional and non-instructional responsibilities, which can negatively impact classroom teaching and learning. Consequently, teachers have limited time to assess students' tasks or prepare lesson plans for effective classroom teaching and learning. In light of this, the study aims to examine the effects of excessive workload on students' academic performance through the perspectives and experiences of Physics teachers. By gaining insights into how workload affects teaching effectiveness and learning outcomes, this research will contribute to the development of strategies to mitigate the negative impacts and promote better academic performance.

Purpose of the Study

The main purpose of was to find out the influence of Physics teachers' excessive workload on students' academic performance. Specifically, the study investigated;

i. the influence that Physics teachers' excess workload has on students' academic performance, and

ii: how the impact of Physics teachers' workload varies across public and private secondary schools.

Research Questions:

i. What is the influence that Physics teachers' excess workload has on students' academic performance?

ii. How does the impact of Physics teachers' excess workload vary across public and private secondary schools?

Research Hypotheses

The following null hypotheses were formulated and tested in this research work.

Ho_1: There is no significant difference in opinions of male and female Physics teachers on the influence of excess workload on students' academic performance.

Ho_2: There is no significant difference in opinions of public and private Physics teachers regarding variation of excess workload across school type.

Ho_3: There is no correlation between Physics teachers' Excess workload and students' academic performance

Method

The study employed a descriptive survey design. It was carried out in Federal Capital Territory (FCT)-Abuja with a target population of three hundred (300) Physics teachers drawn from 16 senior secondary school (8 each from public and private schools) from which a sample of a hundred and twenty (120) respondents in four Area Councils in Abuja were selected using stratified purposive random sampling technique. The instrument used for data collection was a structured questionnaire developed by the researcher and titled 'Physics Teachers' Perspectives of Excess Workload on Students Academic Performance Questionnaire' (PTPEWSAPQ). The questionnaire consisted of two sections: section A, which focused on demographic information, and section B, a 21-item four-point modified Likert rating scale that aimed to gather Physics teachers' opinions on the impact of excess workload on student performance. Additionally, section B also sought their perspectives on the quality of instruction and the variation across school types. The validity of the instrument was ensured through expert opinions of two lecturers in science education from Faculty of education of the University of Abuja. Using Cronbach alpha, the reliability of the instrument was determined to be 0.75. Mean scores were used to answer the research questions. Any questionnaire item with a mean score greater than 2.50 was deemed as being favourably disposed to the respondents while below 2.50 showed unfavourable disposition. The hypotheses were tested at a 0.05 level of significance using independent t-test statistical technique involving difference of means. The Physics students' scores were obtained from the participating schools in the survey conducted. The scores were then analyzed and compiled to determine their performance.

Results

Research Question One: What is the influence that Physics teachers' excess workload has on students' academic performance?

Table 1: Mean Responses on Excess workload on students' performance

S/N	Excess workload lead to the following :	Mean ($\bar{X}$)	S.D	Remark
1	Teachers have enough time for individualized attention	1.01	0.34	Disagree
2	Teachers grade of assignment/projects regularly	1.45	0.25	Disagree
3	Teachers use of technology in lesson delivery	1.48	0.67	Disagree
4	Teachers improvise limited laboratory equipments	1.98	0.56	Disagree
5	Teachers cover subject curriculum timely	2.51	0.21	Disagree
6	Teachers engage in students –centred learning styles	1.44	0.78	Disagree
7	Teachers provide feedback on class work	2.51	0.48	Disagree
8	Teachers use visual aids and demonstrations for lesson delivery	1.80	0.23	Disagree
9	Teachers' lesson notes are organised	2.08	0.69	Disagree
	Grand Mean/ SD	2.11	0.24	

Table 1 reveals that nine (9) items make up this cohort. Out of the nine items in the cohort, items 5 and 7 have the highest mean score of 2.51, while item 1 has the lowest mean score of 1.01, indicating that teachers providing feedback and covering the curriculum timely are the most positively viewed aspects while teachers' individualized attention is the least favoured. The teachers' perception of excess workload is evident in the overall mean score being below the scale mean (2.50). This indicates a strong belief that workload has a detrimental impact on students' academic performance. The scores suggest a significant concern among the teachers regarding the negative impact of excess workload on the students' ability to excel in their studies. The findings suggest that addressing the workload issue is of utmost importance in order to enhance students' academic performance.

Research Question Two: To what extent does Physics teachers' excess workload vary across public and private secondary schools?

Table 2: Mean Responses on Excess workload Variation Across School Type

		Public Schools			Private Schools		
S/N	Item Statement	Mean	SD	Remark	Mean	SD	Remark
1	Physics teachers' workload is manageable	2.52	0.45	Agreed	1.45	0.57	Disagreed
2	The workload allows for professional growth and development	2.54	0.12	Agreed	1.17	0.34	Disagreed
3	Teacher balance professional responsibilities with personal lives	2.58	0.33	Agreed	1.25	0.56	Disagreed
4	The workload allows teachers to focus on providing quality Physics instruction	2.55	0.49	Agreed	2.30	0.12	Disagreed
5	The workload is supported by adequate teaching staff and laboratory Assistance	2.53	0.67	Agreed	1.01	0.14	Disagreed
6	There are enough Physics resources including laboratories to ease workload	2.51	0.35	Agreed	1.89	0.45	Disagreed

7	The workload allows teachers conduct experiment for students	2.53	0.23	Agreed	1.40	0.76	Disagreed
8	The workload enables positive teacher-student relationships, as teachers have enough time to engage with students	2.62	0.46	Agreed	1.37	0.24	Disagreed
	Grand Mean/SD	2.55	0.36		1.48	0.39	

Table 2 shows that the subscale is made up of 8 items. In the context of public schools, all the items were favourably disposed towards the public schools' respondents. However, with respect to private schools, none of the items exhibited a positive disposition towards the respondents. The highest mean score was obtained by Item 4, which states that the workload allows teachers to focus on providing quality Physics instruction, with a score of 2.30. This was closely followed by Item 6, which specifies that there are enough Physics resources, including laboratories, to ease workload, with a mean score of 1.89. Item 5, which states that the workload is supported by adequate teaching staff and laboratory assistance, had the least mean score of 1.01. The grand mean of all the statements falls below the scale mean of 2.50, indicating a negative perception of excess workload among respondents.

For public Physics teachers, Item 8, which states that the workload enables positive teacher-student relationships, as teachers have enough time to engage with students, had the highest mean score of 2.62. This was followed by Item 3, which states that teachers balance professional responsibilities with personal lives, with a mean score of 2.58. On the other hand, Item 6, which specifies that there are enough Physics resources, including laboratories, to ease workload, had the least mean score of 2.51. The respondents demonstrated an average score of 2.55 above the borderline, indicating their ability to handle excess workload. This can be attributed to the fact that public secondary schools are better resourced in terms of both human and material resources, compared to private schools.

Hypotheses

H_{O1}: There is no significant difference in opinions of male and female Physics teachers on the influence of excess workload on students' academic performance.

Table 3: t-test statistics of Physics teachers' opinions on the influence of excess workload on students' academic performance

Variable	Number (N)	Mean($\bar{X}$)	SD	df	t-cal	t-cri
Male teachers	62	2.14	0.16			
				118	0.31	1.96
Female teacher	58	2.08	0.23			

Table 3 shows that the obtained t-value of 0.31 falls within the critical value range of ± 1.96 for a two-tail test with a significance level of 0.05, leading to not rejecting the null hypothesis and signifying no statistically significant difference in Physics teachers' opinions on the influence of excess workload on students' academic performance based on gender. When it comes to excess workload, both male and female teachers have remarkably similar opinions. Both genders agree on the negative impact it has on their job satisfaction, stress levels, and overall productivity. They also recognize the need for support and resources to alleviate the workload burden and promote a healthier work-life balance.

Ho_2: There is no significant difference in opinions of public and private secondary school Physics teachers regarding variation of excess workload across school type.

Table 4: t-test statistics of Physics teachers' opinions on the influence of excess workload on students' academic performance

Variable	Number (N)	Mean($\bar{X}$)	SD	df	t-cal	t-cri
Public School teachers	70	2.55	0.36			
				118	9.51	1.96
Private School teachers	50	1.48	0.39			

Table 4 shows that the obtained t-value of 9.51 falls outside the critical value range of ± 1.96 for a two-tail test with a significance level of 0.05, leading to rejection of the null hypothesis and signifying statistically significant difference in variation of excess Physics teacher across school type. The disparity suggests that private school teachers face unique challenges and stressors compared to public school teachers.

Ho_3: There is no correlation between teachers' workload and students' academic performance

Table 5: Summary of Correlation Coefficient Between Physics teachers' workload and students academic performance

Variables	Pearson's Correlation Coefficient
Physics Teachers' Workload	r=-0.812**
Students. academic Performance	

Table 5 presents the analysis of correlation between Physics teachers' workload and students' academic performance. The results of the analysis indicated a statistically significant negative correlation between Physics teachers' workload and students' academic performance. The correlation coefficient, r = -0.76, ranged from (-0.78, -0.93) with a p-value of less than 0.001

Discussion

The research findings reveal that Physics teachers face challenges in completing the curriculum. It seems that accomplishing this task has become more difficult than before due to an increase in workload, which indicates a shift in priorities. The study emphasizes the need for curriculum designers to consider the growing workload of teachers while creating courses. This shift in priorities can be attributed to various factors, such as larger class sizes, additional responsibilities, and insufficient time for professional development. Consequently, many teachers find it hard to keep up with the curriculum, causing them to feel frustrated and inadequate. The study's results align with Obi's (2020) findings that the current Physics curriculum in use is overloaded. This indicates that the problem of curriculum overload in the Physics curriculum is persistent and requires attention.

The findings of the study revealed that Physics teachers in public schools experience less pressure due to excessive workload compared to their counterparts in private secondary schools. This difference can be attributed to the better resource allocation in public schools. One of the key factors contributing to this difference is the availability of skilled personnel in public schools. Public schools tend to have a larger staff pool, including dedicated support personnel such as teaching assistants, laboratory attendants, and instructional aides. These individuals can help alleviate the workload of Physics teachers by assisting with administrative tasks, grading assignments, and providing additional

instructional support. Moreover, public schools also have access to a wider range of material resources. This includes textbooks, laboratory equipment, and teaching aids, which can facilitate effective teaching and learning. This access to resources allows Physics teachers in public schools to focus more on their teaching duties and reduces the burden on them in terms of planning and preparing lessons. The findings of this study are in agreement with previous research conducted by Betts, Zau, & Rice's (2021) study examined the working conditions of teachers and found a positive correlation between resource allocation and job satisfaction. The findings suggest that when teachers have adequate support and resources, they experience less stress and frustration, leading to better job satisfaction.

On the test of hypotheses, the study results revealed that although there was no significant difference between male and female Physics teachers in terms of excess workload, there was a significant gap between public and private school teachers' views on its impact on their profession. Public school teachers generally reported feeling better equipped to handle excess workload than their private school counterparts, highlighting the notable variations in perspectives across different teacher groups regarding the impact of excess workload on their profession.

Furthermore, the study found a significant negative correlation between Physics teachers' workload and students' academic performance. This correlation suggests that as Physics teachers' workload increases, there is a corresponding decrease in students' academic performance. High workload can lead to teachers feeling overwhelmed and stressed, which can negatively impact their teaching strategies, classroom management, and overall effectiveness. It is worth noting that teachers who are overburdened may find it challenging to create engaging lesson plans, conduct experiment for students, differentiate instruction to meet students' diverse needs, and provide feedback and support to students who are struggling. These findings align with Osagie and Okafor's (2020), research that due to the population explosion and inability of the local government to employ more teachers in Nigeria, it has led to too much workload for the teachers and this has certainly affected the academic performance of the students.

Conclusion

The findings of this study indicate that teachers' workload has a significant impact on students' academic performance. A statistically significant and negative relationship was found between teachers' workload and students' academic performance. This suggests that an increase in teachers' workload results in a decline in students' academic performance.Both male and female perspectives agree on the negative effects of an excessive workload on their performance and their students' academic success. The study further shows that public schools with better human and material resources tend to have teachers who are better equipped to handle their workload effectively. The ability to manage workload effectively has been linked to improved student outcomes, such as higher grades and better performance on standardized tests.

Recommendations

The study recommends that:

i. In order to enhance the quality of Physics education and enhance academic performance of students, more qualified Physics teachers should be employed

ii. There should be provision of more Physics material resources in lab.

iii. The current Physics curriculum should be reviewed to address the issue of curriculum overload.

iv. The utilization of technology should be employed to tackle the surge in student enrolment.

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