

PARENTAL INVOLVEMENT AND ACADEMIC ACHIEVEMENT OF SECONDARY SCHOOL STUDENTS IN PHYSICS AND CHEMISTRY IN ODEDA LOCAL GOVERNMENT AREA, ABEOKUTA, OGUN STATE, NIGERIA

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Abstract

Quality parental involvement is an important aspect of a child's academic training capable of improving a child's academic achievement and lifelong learning. This study examined the level of parental involvement in students' academic lives under behavioural, cognitive, and affective classes, and its effect on students' academic achievement in Physics and Chemistry. The study employs a quantitative-descriptive method, with a sample of 300 students selected from public secondary schools within the local government area. Data were collected through a self-structured parental involvement scale and students' second term result sheets, and analyzed using mean, standard deviation, t-test and multiple regression analysis at a 0.05 significance level. The results showed: (i) a generally low Behavioural Parental Involvement, **BPI = 1.85**; Cognitive Parental Involvement, **CPI = 1.62**; and Affective parental involvement, **API = 1.87**, in students' academic lives; (ii) a significantly positive composite relationship between BPI, CPI, API and academic achievement (**r = 0.645**) (iii) that both the BPI, CPI and API jointly contributed and influenced academic achievement (**R² = 0.416**) of students in Physics and Chemistry to about 41.6 %, (iv) a statistically significant positive effects of BPI ($\beta = 0.342$, $t = 14.730$, $\text{Sig.} = 0.001$), CPI ($\beta = 0.483$, $t = 14.821$, $\text{Sig.} = 0.001$) and API ($\beta = 0.566$, $t = 15.316$, $\text{Sig.} = 0.001$), contributing about **34.2 %**, **48.3 %** and **56.6 %** respectively, to students' academic achievement. It is recommended that school authorities should develop strategies that will ensure maximum parental involvement in students' education.

Keywords: Parental Involvement, Academic achievement, Physics, Chemistry, Odeda

1.0 Introduction

Physics and Chemistry are physical science subjects that are basically rooted in both practical and theoretical aspects, with mathematical and non-mathematical foundations that are generally useful in the modern-day technological world. These subjects (Physics and Chemistry) are often perceived as challenging

and abstract, leading to lower student motivation and performance compared to other disciplines.

Physics basically seeks to describe the fundamental laws of nature through mathematical models, experimental validation and theoretical exploration; relying heavily on mathematics as a precise language for modelling

reality (Tipler & Mosca, 2020; Redish, 2017). Though regarded as abstract and difficult, it has concepts and techniques that support the development of other areas of science such as engineering, medicine, agriculture, pharmacy and other science-based courses, consequently leading scientific and technological development (Mokuolu & Fatoba, 2020; Mokuolu & Adelekan, 2020; Mokuolu & Ojo, 2023). Chemistry, on the other hand, encompasses understanding the interactions between atoms and molecules, the forces that govern chemical bonds, and the energy changes associated with chemical reactions (Atkins & de Paula, 2017; Tro, 2020). Thus, Chemistry serves as a bridge between the physical sciences (like physics and earth sciences) and life sciences (like biology and medicine), providing a molecular-level understanding of the substances that make up the universe and enabling interdisciplinary understanding and application (Atkins & de Paula, 2017; Mahaff et al., 2018).

Parental involvement is an important aspect of a child's academic life because it plays a significant part in the child's academic achievement. Parental involvement in education represents encompassing actions, characters and behaviours put up by parents towards the educational life of a child. Epstein et al. (2018) described parental involvement as a way in which parents get involved in their children's education and consistently show excellent parenting skills; including talking to the school staff, volunteering their time at school, helping their children learn at home, being involved in school decisions, and working with the school community on a regular basis. Parental involvement may also be viewed as various actions and procedures that parents may take at home or school including other parents' commitment and active engagement in both the school and their children's education (Dawadi,

2020; Laura & Mahia, 2019). Parental involvement can take a wide variety of forms, among them, communication between family and school, supporting learning activities at home, setting goals, providing learning materials, volunteering, and involvement in school activities have been highlighted (Schueler et al., 2017; Rohana et al., 2024).

Empirical findings have demonstrated a positive association between parental involvement in education and academic achievement (Tárraga et al., 2017), improving children's self-esteem and their academic performance (Garbacz et al., 2017). Several other research studies have revealed that the parental involvement in education has been found to have a significant positive effect, impact and relationship on academic performance of students (Jeynes, 2016; Laura & Mahia, 2019; Ayeni, 2021; Anierobi & Unachukwu, 2020; Onongha et al., 2022; Ranganathan & Kavitha, 2022; Angwaomaodoko, 2023; Dela et al., 2023).

This study classified parental involvement into three types, namely; behavioral, cognitive, and affective involvement (Hoover-Dempsey & Sandler, 1997). Behavioural involvement refers to parents' physical presence in their children's education, such as attending parent-teacher conferences and school events (Đurišić & Bunijevac, 2017). According to Đurišić and Bunijevac (2017), behavioural involvement, such as attending parent-teacher conferences, has been found to increase parents' knowledge about their children's academic progress and help teachers understand the child's home environment. Cognitive involvement involves parents' efforts to promote their children's academic success, such as helping with homework and providing educational resources at home (Chophel & Choeda, 2021). Cognitive involvement, such as

assisting with homework, has been linked to higher academic performance, better study habits, and improved attitudes toward school (Patall et al., 2008; Chophel & Choeda, 2021). Affective involvement refers to the emotional support that parents provide to their children, such as encouragement and motivation (Mata et al., 2018). Affective involvement, such as providing emotional support, has also been shown to have a positive impact on students' academic achievement (Mata et al., 2018; Xia et al., 2019). Piskorz-Ryń and Chikwe (2024) also found that parental involvement, such as emotional support, academic assistance, and financial support, significantly enhanced academic performance and student well-being.

Research has demonstrated that when parents are actively involved in their children's education, it greatly impacts their academic achievement (Boonk et al., 2018). It was observed that children whose parents are actively engaged in their education (such as helping with homework, attending school events, and communicating regularly with teachers) tend to perform better academically (Omar, 2024). Garcia and Lopez (2021) in their study also found that parents who regularly checked their children's math homework, provided explanations for math concepts, and encouraged problem-solving strategies at home had children who performed better in math assessments. According to Dogomeo and Aliazas (2022), actively involved parents are more effective in encouraging their children's engagement and enthusiasm for learning.

1.1 Statement of The Problem

Academic achievement in Physics and Chemistry remains a major concern in many secondary schools, as students often struggle with the abstract concepts, problem-solving skills, and rigorous demands required in these

subjects. While numerous educational reforms have focused on curriculum content, improving teaching strategies and school resources, the role of parental involvement in influencing academic outcomes in Physics and Chemistry has not been adequately examined. Even though various studies have explored the general links between parental involvement and academic achievement, limited research has focused on its relationship, influence, extent and nature on Physics and Chemistry at the secondary school level.

1.2 Purpose of the Study

The purpose of this study is to examine the relationship between parental involvement and student academic achievement in Physics and Chemistry at the secondary school level. It also seeks to determine the effect and level of parental involvement influencing students' academic achievement in these subjects. Findings from this study will provide useful information regarding parental participation in students' academic life and in schools.

1.3 Research Question

What is the level of parental involvement in the academic life of students in Odeda Local Government Area, Abeokuta, Ogun State?

1.4 Research Hypotheses

1. There is no significant composite (joint) contribution of behavioural, cognitive, and affective parental involvements to students' academic achievement in Physics and Chemistry.
2. There is no significant relative/individual contribution of behavioural, cognitive, and affective parental involvements to students' academic achievement in Physics and Chemistry.

2.0 Research Methodology

This study employs a quantitative approach using descriptive-inferential research methods. The target population for the study includes all secondary school science (Physics and Chemistry) students within Odeda local government area, Abeokuta, Ogun state, Nigeria. The study uses a systematic random sampling technique to select six public secondary schools within the local government area, while a simple random sampling technique was used to choose three hundred (300) students, comprising SSS II science students from the selected six schools as the sample size.

Data were collected with the aid of two research instruments, namely Second Term Result Broad Sheets (STRBS) and Parental Involvement Scale (PIS). The STRBS is a collection of SS II second term results in Physics and Chemistry, which are used in conjunction with the PIS for data collection. The PIS is a 15-item questionnaire developed by the researcher to measure parental involvement in students' academic lives. The PIS was divided into sections A and B. Section A was used to collect the students' demographic information such as name, class, age, and gender. Section B was designed to evaluate the three components of parental involvement namely, behavioural, cognitive and affective parental involvement. Each of the evaluated components was made up of five items, making up a total of 15 items.

Responses to the PIS were based on a four-point Likert scale of Strongly Agree (SA = 4), Agree (A = 3), Disagree (D = 2) and Strongly Disagree (SD = 1).

The PIS was validated by expert colleagues in measurement and evaluation. The reliability was determined using the test-retest method. This involves the PIS being pilot-tested using a sample of 50 students who were not part of the sample used for this study. The reliability coefficient of the PIS was calculated using Cronbach's Alpha statistic to yield a value, $\alpha = 0.76$. The PIS was administered to the sample students under examination conditions and was collected back from them after 50 minutes. The time given was to enable them to have enough time to reasonably and correctly answer the PIS items. All collected data were subjected to statistical analyses such as mean, standard deviation, t-test and Multiple Linear Regression analysis using SPSS software. The level of parental involvement for each item and component of the PIS was determined using the mean PIS scores and terms as follows:

Mean Score of PIS = **1.00 – 1.99**: Low Level of Parental Involvement

Mean Score of PIS = **2.00 – 2.99**: Moderate Level of Parental Involvement

Mean Score of PIS = **3.00 – 4.00**: High Level of Parental Involvement

3.0 Result and Discussion

Research Question: What is the level of parental involvement in the academic life of students in Odeda Local Government Area, Abeokuta, Ogun State?

Table 1a: Levels of behavioural parental involvement as perceived by students

S/N	Behavioural Parental Involvement Statement	MS	LoPI
1.	My parent communicates with my teachers regarding my academics.	1.86	Low
2.	My parent attends P.T.A. meetings and school events.	2.67	Moderate
3.	My parent attends open days and inter-house sports activities.	1.52	Low
4.	My parent monitors my school attendance and punctuality.	1.68	Low
5.	My parent occasionally visits my school to build rapport with my teachers and stay informed	1.54	Low
Average Behavioural Parental Involvement (BPI_A)		1.85	Low

MS = Mean Score, LoPI = Level of Parental Involvement

Table 1a shows the students' responses to the various aspects of behavioural parental involvement under study based on their experiences. As observed from the table, the parental effects in terms of their physical presence in the students' academic lives are low (**LoPI = 1.52 - 2.67**), except in the case of "parent attending P.T.A. meetings and school events" where the students observed moderate parental involvement (**LoPI = 2.67**). Generally, as indicated by the table above, the average behavioural parental involvement in students' academic lives is low (**BPI_A = 1.85**). This implies that the majority of the parents in areas under study do not really have enough time to spare for their children's academic lives as expected.

Table 1b: Levels of cognitive parental involvement as perceived by students

S/N	Cognitive Parental Involvement Statement	MS	LoPI
1.	My parent always help me with my homework	1.42	Low
2.	My parent set a regular time each day for my homework or revision.	1.50	Low
3.	My parent ensures my study time is free from noise and distractions (TV, mobile phones, etc.).	2.22	Moderate
4.	My parent provides a quiet, organised, and well-lit space for me to study.	1.52	Low
5.	My parent provides learning resources for me at home.	1.46	Low
Average Cognitive Parental Involvement (CPI_A)		1.62	Low

MS = Mean Score, LoPI = Level of Parental Involvement

Table 1b indicates students' responses to the varying aspects of cognitive parental involvement under study based on their experiences. With the exception of "parent ensuring that students' study time is

free from noise and distractions (TV, mobile phones, etc, **LoPI = 2.22**”), the cognitive parental involvement in students’ academic lives are low (**LoPI = 1.42 - 2.22**). On a general note, as indicated by the table above, the average cognitive parental involvement in students’ academic lives is very low (**CPI_A = 1.62**). This implies that the majority of the parents in areas under study do not seriously prioritise the academic success of their children to greater extent.

Table 1c: Levels of affective parental involvement as perceived by students

S/N	Affective Parental Involvement	MS	LoPI
1.	My parent usually praises/celebrate my grade/score or any good thing about my studies.	2.48	Moderate
2.	My parents help me in setting my academic goals.	1.62	Low
3.	My parent always express their confidence in me to do well in my studies.	1.75	Low
4.	My parent do not ridicule me when I perform poorly in my studies, instead they encourage me.	1.88	Low
5.	My parent usually ask about my academic struggles/challenges and encourage me.	1.64	Low
Average Affective Parental Involvement (API_A)		1.87	Low

MS = Mean Score, LoPI = Level of Parental Involvement

Table 1c shows the students’ responses to the various aspects of affective parental involvement under study based on their experiences. As observed from the table, the parental effects in terms of the aspects of the affective involvement in the students’ academic lives are low (**LoPI = 1.62 - 2.48**), except in the case of “parent praising/celebrating grades/scores or any good thing about the student’s studies” where the students observed moderate parental involvement (**LoPI = 2.48**). In summary, the table indicates that the average affective parental involvement in students’ academic lives is low (**API_A = 1.87**). This implies that the majority of the parents in areas under study do not emotionally get much involved in their children’s academic lives as expected.

Research Hypothesis 1: There is no significant composite (joint) contribution of Behavioural Parental Involvement (BPI), Cognitive Parental Involvement (CPI), and Affective Parental Involvement (API) to students’ academic achievement in Physics and Chemistry.

Table 3: Model summary results of relationship in Multiple Regression Analysis

Model	R	R ²	Adjusted R ²	Std. Error of Estimate
1	0.645	0.416	0.414	1.036

Predictors: (Constant), Behavioural Parental Involvement, Cognitive Parental Involvement and Affective Parental Involvement.

Table 3 shows the results of the multiple regression analysis conducted to determine the combined contribution of BPI, CPI and API to

the academic achievement of students in Physics and Chemistry. As indicated by the table, the regression coefficient, R = 0.645 indicates that a

significantly positive composite relationship exists between BPI, CPI, API (predictors) and academic achievement of students in Physics and Chemistry. Likewise, the regression's coefficient of determination, $R^2 = 0.416$, indicates that both the BPI, CPI and API jointly contributed and influenced academic achievement to about 41.6 %, while the remaining 58.4 % may be due to other factors not included in this study.

These results are in accordance with previous research works of Garcia and Lopez (2021), Angwaomaodoko (2023), Aishatu et al. (2024), and Piskorz-Ryń and Chikwe (2024). Garcia and Lopez (2021) in their study observed that active parental involvement which involves aspects of behavioural, cognitive and affective

parental involvements, such as assistance with homework, engagement in math-related activities, and communication with teachers, correlated positively with higher math achievement scores. Angwaomaodoko (2023) and Aishatu et al. (2024) in their separate studies found that behavioural, cognitive and affective parental involvement are positively associated with student academic performance. Piskorz-Ryń and Chikwe (2024) in their study also observed that some aspects of behavioural, cognitive and affective parental involvement, such as emotional support, academic assistance, and financial support, significantly enhanced academic performance and students' well-being.

Research Hypothesis 2: There is no significant relative/individual contribution of Behavioural Parental Involvement (BPI), Cognitive Parental Involvement (CPI), and Affective Parental Involvement (API) to students' academic achievement in Physics and Chemistry.

Table 4: Coefficients results in the Multiple Regression Analysis

Model	Unstandard Coefficient		Standard Coefficent	t	Sig.
	B	Std. Error	Beta		
Constant	5.711	0.459		11.11	0.000
BPI	0.281	0.022	0.342	14.730	0.001
CPI	0.274	0.020	0.483	14.821	0.001
API	0.256	0.019	0.566	15.316	0.001

Dependent Variable: Achievement, **Independent Variable:** BPI, CPI, API

Table 4 shows the resultant coefficients in the multiple regression analysis conducted to determine the relative contribution of BPI, CPI, and API to the academic achievement of students in Physics and Chemistry. As indicated by the table, the BPI ($\beta = 0.342$, $t = 14.730$, $\text{Sig.} = 0.001$), CPI ($\beta = 0.483$, $t = 14.821$, $\text{Sig.} = 0.001$) and API ($\beta = 0.566$, $t = 15.316$, $\text{Sig.} = 0.001$) have statistically significant positive effects on students' academic achievement in

Physics and Chemistry. In other words, the BPI, CPI, and API contributed about 34.2 %, 48.3 % and 56.6 % respectively, to students' academic achievement in Physics and Chemistry. Therefore, based on this result, the API contributed more to students' academic achievement in Physics and Chemistry than the BPI and CPI.

These results support previous research works which observed that affective involvement, such as providing emotional support, has also been shown to have a positive impact on students' academic achievement. Parents who provide emotional support to their children have a higher likelihood of raising children who are motivated to succeed in school and have higher self-esteem (Mata et al., 2018; Xia et al., 2019). Hardaway et al. (2020) highlight how emotional support mechanisms within the family can significantly influence academic achievement, particularly among low-income African American adolescents. Summarily, as observed in this study, all forms of parental involvement have been found to have significant individual positive contributions to student academic achievement. In other studies by Mata et al. (2018), and Chophel and Choeda (2021), cognitive, behavioural and affective involvement has been found to have a strong association with academic accomplishment.

4.0 Conclusion

Results from this study revealed that the average behavioural, cognitive and affective parental involvement in students' academic lives is general low (**BPI_A = 1.85, CPI_A = 1.62, API_A = 1.87**). This implies that majority of the parents in areas under study do not really get much involved in their children's academic lives as expected, especially in terms of physical presence in their children's education, such as attending PTA meetings and other school events; promoting their children's academic success, such as helping with homework and providing educational resources at home; and in giving emotional supports such as encouragement and motivation.

The results indicated a significantly positive composite relationship between Behavioural Parental Involvement, BPI,

Cognitive Parental Involvement, CPI and Affective Parental Involvement, API (predictors) and students' academic achievement in Physics and Chemistry (**r = 0.645**) with both BPI, CPI and API jointly contributed and influenced academic achievement to about **41.6 %**, while the remaining **58.4 %** may be due to other factors not included in this study. The BPI, CPI and API were also observed to have contributed about **34.2 %, 48.3 %** and **56.6 %** respectively, to students' academic achievement in Physics and Chemistry.

Recommendation

Based on the observations of this study, it is therefore recommended that:

1. School authorities, Teachers and the Government should put in great effort to ensure that parents/guardians are more involved in students' educational lives.
2. School authorities and Teachers should ensure to communicate students' parents/guardians regularly.
3. Programmes of recommendation and awards that can attract the attention and participation of parents/guardians should be regularly organised.

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