Effect of Parental Involvement on Students' Mathematics Performance in Relation to Solving Chemistry Problems: A Study in Ilesa East Local Government Area, Osun State, Nigeria

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Abstract- ***The research reveals the effect produced by the participation of parents on the mathematics achievement in correlation with solving chemistry problems in Ilesa East Local Government Area, Osun State, Nigeria. A total number of 1500 students were used in this present study, with their age ranged from 12 to 18 years. The study investigates how various aspects in which parents get involved in their children's academic activities, such as assistance rendered on assignments, involvement in school activities, academic progress discussions, encouragement for practice, and support in locating educational resources, affect achievement in mathematics skills of students and their capacities in the application of the skills in chemistry contexts. Over half of the population of the students acknowledged less support from parent in the assignments, academic progress discussions, and location of educational resources; hence the data from the study show a major disparity in parental engagement. It has been revealed that only 11.0% acknowledged involvement of parents in academic discussions regularly, showing a significance study gap in support for students' mathematics education. Furthermore, there is wide variation in which students confidently approach chemistry problems through the use of mathematical skills, with 35.9% showing strong anxiety about their skills, this is expressing that a lack of assistance correlates with poor self-assessment and increased stress related to applying mathematics in chemistry. The data from this research show that 36.3% of students' revealed lower average scores in mathematics, while a significant percentage (53%) obtained lowest grades (E) in chemistry in terms of academic performance. 67.71 % of the students acknowledged a positive relationship between their mathematical skills and performance in chemistry despite their lower grades in chemistry, indicating the important aspect of mathematics in understanding chemistry concepts. The obstacles revealed, including less from parents and difficulty in quick understanding of mathematical concepts, call for the need to increase parental involvement and training in effective methods of teaching. Therefore, the data provided from this study illustrate the need of enhancing a collaborative educative environment where strong parental engagement in their children's academic process, more importantly in subjects such as mathematics and chemistry. This research seeks to contribute to the discourse on educational strategies in Nigeria, advocating for policy interventions that promote parental engagement as a transformative mechanism for improving student performance in STEM subjects.***

Indexed Terms- ***Parental Involvement, Mathematics Performance, Chemistry Problems, Student Achievement, Ilesa East, Nigeria, STEM Education.***

I. INTRODUCTION

The constant involvement of parent has been adapted to the improvement in good response of student in mathematics instruction. When there is complete participation of parent leads to internal motivation and

engagement of students in mathematics learning, credited to meta-analysis, which brings about self-reliance and confidence in students, aiding in creating an environment that is conducive for learning (12, 29). Therefore, there is an important effect in the academic performance of students when parents fully involved in their children academic processes.

Chemistry and Mathematics have a major significant interconnection in science education. Chemistry, as one of the important and backbone of science, involves the rudiment of mathematics solving calculation problem and quantitative laboratory analysis. The application of principles in chemical reactions enhances the teaching of mathematics, in-depth thinking and proffer solution to problem (15). It shows that the achievement in mathematics and its mastery arises from its relationship to chemistry.

Many researches have shown what should be the outcome relationship between capacity in mathematics and chemical competence. For instance, a study has a good connection between mathematical proficiency of students and their success in chemistry (2). Further research explained that the strength of student in mathematics results in good performance in chemistry. The research further stated that the programs laid down for enhancing the students' performance in mathematics has been achieved through their ability to tackles many complex and difficult chemical equations in chemistry. The success of students in chemistry has also been linked to a research conducted in Ogbomoso, Nigeria, in which there strong participation of parents in their children's mathematics assignments, with home-based involvement being particularly strong. Therefore, much attention has been paid to the role that family engagement plays in the Nigerian educational system.

The importance of problem-solving methods in chemistry cannot be overemphasized. The use of mathematical reasoning in solving problems in many chemistry topics, such as stoichiometric calculations and chemical equilibrium depict a special way of teaching chemistry. The skills acquired by students in writing and balancing of chemical equations helps in solving quantitative analytical issues (24). This highlights how crucial it is for students to become proficient in mathematics so as to solve chemistry problems.

As a result of positive and strong participation of parents in their children mathematics assignments proportionally gives rise to a better boost in their chemistry results. Through the creation of an avenue for the promotion of mathematics education, problems in chemistry can be solved as a result of parent involvement in their children's mathematics home works, which corroborates a significant link between parental involvement in mathematics education and academic success of students (19).

However, knowing the distinct dynamics of participation of parent and how it impacts students' chemistry and mathematics performance in the context of Ilesa East Local Government Area, Osun State, Nigeria, is important. Academic success in these areas may be increased by interventions produced especially to promote active parental involvement. This study aims to explore the relationship between parental involvement and students' mathematical performance and, consequently, their ability to solve chemical problems. This will add to the broader discussion on effective teaching strategies in science education.

II. LITERATURE REVIEW

Theoretical Framework

In education, the participation involving parent is an important, various and multifaceted process, and this comprises of stepwise activities such as assisting with assignments, attending school functions, and reinforcing academic goals. Self-Determination Theory (SDT) has served as an important theory which served as bedrock for understanding the level of success in the academic outcomes of students offered by the participation of parent. Strong parental involvement increases students' internal motivation and transforms their achievement academically by meeting their core psychological needs for autonomy, competence, and relatedness, as pointed out by SDT (23). The academic performance and intrinsic motivation of students can be affected negatively when the parental actions are given too much acceptance (25).

Positive parental involvement through autonomy assistance and encouragement, has led to the positive involvement and performance shown by students in mathematics education. Therefore, students who get this supportive engagement feel more competent and motivated, which improves their performance in arithmetic (11). On the other hand, negative involvement on the side of parents, such as too much control or pressure gives rise to reduction in students' internal motivation and autonomy, and this will results in poor performance in mathematics (31). These show that there is a relevance between mathematics and chemistry where the ability to solve mathematical problems is crucial. However, increase in the academic independence, in mathematical expressions arising from the chemical equations of chemistry, of students is resulted from positive parental actions, which will improve their overall achievement of students in the course.

Empirical Research

Empirically there is positive relationship between academic performance of students and the involvement of parents in the educational activities of their children. Such involvement by parents include assisting with homework and encouraging children's goals to pursue further education, leads to positive performance of students in mathematics (29). Also, positive attitudes of students towards mathematics and academic performance has been attributed to strong participation of parent in the academic activities of their wards, through which they motivate and provide materials needed (19). These reveal how crucial parental involvement is in influencing youngsters' mathematical proficiency.

In the same vein, it has also been shown that parental involvement improves student achievements in the field of chemistry education, which frequently calls for strong quantitative abilities. A study has shown the correlation between children' academic excellence in senior secondary school chemistry and parental support (21). The study revealed that better response was found in student performance in chemistry and this was substantially related with parental engagement, especially in the form of learning materials and creating a nurturing home atmosphere. It is concluded that that engagement on the part of parent improves students' mathematical proficiency as well as their capacity to use that proficiency to solve chemistry problems.

Conceptual Framework

Participation involving parent has been known as one major reference affecting the academic excellence of students in all subjects, which include mathematics and chemistry. This conceptual framework finds how parental involvement in mathematics education influences the capacities of students tackle solve chemistry problems, especially in the context of Ilesa East Local Government Area, Osun State, Nigeria.

Parental engagement and Mathematics Performance

Research revealed that there is a positive correlation between parental engagement and students' mathematics performance. A study conducted in Nigeria revealed that parental support and interest significantly influence students' performance in mathematics (26). Similarly, a meta-analysis showed that many forms of parental involvement, such as homework assistance and academic encouragement give positive results in mathematics performance of students. These studies indicate that when parents strongly involve in their children's mathematics education, it increases the understanding of students and performance in the mathematics.

Mathematics Skills as a Foundation for Chemistry Problem-Solving

In problem-solving situation, application of mathematical knowledge is needed in Chemistry as a subject in science. Some of the major topics, such as stoichiometry, chemical equilibrium, and thermodynamics in chemistry, require strong mathematical skills. Therefore, complex problems in chemistry can be resolve through higher proficiency in mathematical skill. Studies have shown that students with higher mathematical competence tend to perform better in chemistry, as they can more effectively apply quantitative reasoning to chemical contexts.

Parental Involvement in Mathematics and Its Indirect Effect on Chemistry Performance

As a result of the interrelationship between mathematics and chemistry, it is significant that parental engagement in mathematics education not only boosts achievement in mathematics but also indirectly assists students' abilities in chemistry. By

fostering a supportive environment for mathematics learning, development of analytical skills and confidence that are transferable to chemistry problem-solving in students may be achieved through parental assistance. For instance, a study revealed that parental involvement positively affects attitudes students towards science subjects, including chemistry, thereby improving their performance.

Contextual Structure

In Nigeria, educational system provides special opportunities as well as obstacles. A study conducted in Ogbomoso revealed the effect of involvement of parent on students' mathematical achievement (1). The study revealed that students' achievement in mathematics was significantly showed positive response through home-based involvement, which include offering study materials and setting up a comfortable study space. These results demonstrate how important parental involvement is increasing children's mathematical proficiency in the Nigerian setting.

It is reasonable to assume that comparable trends exist between parental participation and pupils' achievement in chemistry and mathematics when concentrating on the Ilesa East Local Government Area in Osun State, Nigeria. Given the fundamental role of mathematical problem-solving in chemistry, parents who actively support their children's education-by giving resources, encouragement, and a conducive learning environment, which are likely to improve their children's ability in both mathematics and chemistry. In order to improve students' academic performance in these crucial topics, it is crucial to develop efficient parental involvement strategies that are adapted to the unique cultural and socioeconomic circumstances of areas like Ilesa East.

III. OBJECTIVES OF THE STUDY

The objectives of this study are to:

- evaluate parental involvement;
- analyze the relationship between parental engagement and performance of students;
- examine the attitudes of students toward mathematics in chemistry aspect;
- determine the impact of academic achievement;
- identify challenges students faced;
- provide recommendation for educational strategies; and
- contribute to policy development

IV. RESEARCH METHODOLOGY

This chapter discussed the various methods used in the study. It contained and explained the following; Research design, Population of the study, Sampling technique and sampling size, description of research instrument, validity of research instrument, method of data collection and method of data analysis.

Research Design

This research adopted the survey method in data collection. It is used to obtain the peoples opinion through questionnaire. Research design encompasses the strategies, methods, and procedures employed by researchers to structure a study; thereby ensuring that the data collected is relevant and provides valuable insights into the research issue at hand (5).

Population of the Study

In research studies, it is customary for researchers to select a sample from a larger population, which constitutes a smaller, more manageable group designated for data collection. Various methodologies, including random sampling, may be utilized in this selection process (5). The objective is to establish a sample that accurately represents the population, thereby minimizing sampling bias and enabling the results to be generalized to the wider population.

Based on the data obtained from the five (5) secondary schools in Ilesa East Local government, Osun State, Nigeria comprising of three (3) private schools and 2 public schools, the population of study of the entire students used in this research for 2024/2025 academic session is 1,500. The population of the study comprises of the following students:

St. Lawrence's Grammar School (Public) …… 300

Babalola Memorial Girls Grammar School (Public) …… 300

Bibo Oluwa Academy (Private) ……..……300

Potter and Clay Schools (Private) ……. 300
Christ the King Academy (Private) …….....300

Sampling Technique/ Sample Size
A sample is defined as a subset of individuals, items, or observations selected from a larger population for the purposes of research. Researchers utilize a variety of sampling techniques, including random sampling, stratified sampling, and convenience sampling, to select the sample in a manner that minimizes bias and enhances in generalizing of the findings (27). The random selection from five (5) different schools with a total population of 1500 student as stated above.

Sampling Technique
Using the simple random sampling technique, five secondary schools were selected from Ilesa East local government. Thereafter, the researcher purposively selected a sample size of 1500 respondents from the five secondary schools.

St. Lawrence School contributed a sample size of 300 respondents, Babalola Girls Grammar School contributed a sample size of 300 respondents, Bibo Oluwa Group of Schools contributed a sample size of 300 respondents, Potter and Clay Schools contributed a sample size of 300 respondents, Christ the King Academy contributed a sample size of 300 respondents. Therefore, the sample size for the study was 1500 respondents.

Description of Research Instrument
The research instrument used in the study was the questionnaire. Questionnaires are extensively utilized across various research domains, including social sciences, health studies, market research, and education (5). The design and administration of these instruments can significantly affect the quality and validity of the data obtained. Specifically, factors such as the phrasing of questions, the sequence in which they are presented, and the response options provided can all influence participants' comprehension and responses to the questions (9).

A total number of twenty-one (21) items were drawn and administered to the respondents. They were divided into four sections. Section A contained items on the demography of respondents and section B, C, and D answered the research questions as follows:
item 1-6 answer the demographic questions;
item 7-11 answer analysis of parental involvement;
item 12-16 answer analysis of attitudes towards mathematics in solving chemistry problems; and
item 17-21 answer academic performance in mathematics and chemistry.

Validity of Data Gathering Instrument
The questionnaire used for this study was thoroughly checked for clarity, precision, and comprehension.

Method of Data Collection
Data was collected using the questionnaire which the researcher administered face to face to the respondents. Out of 1500 copies of questionnaire distributed to the respondents, 1420 copies were retrieved. This represented a response rate of 94.7%.

Method of Data Analysis
Simple tables, frequency and percentages were adopted in the presentation and analysis of the data generated for the study. These statistical tools were used because they were suitable means of breaking down and analyzing the generated data.

V. RESULTS OF THE STUDY

A. Demographic studies

1: What is your age bracket?

Response	Frequency	Percentage (%)
11-13	650	45.77
14-16	520	36.62
17-18	250	17.61
Total	1420	100

From the table above, 650 respondents (45.77%) fell under the age bracket of 11-13, while 520 respondents (36.62%) were under the bracket of 14 - 16, while 250 respondents (17.61%) were under the age bracket of 17-18.

2: What is your gender?

Response	Frequency	Percentage (%)
Male	595	41.90

Female	825	58.10
Total	1420	100

From the table above, 595 respondents (41.9%) were males while 825 respondents (58.1%) were females.

3: What is your class level?

Response	Frequency	Percentage (%)
Year 10/S.S.S 1	675	47.5%
Year 11/S.S.S.2	450	31.7%
Year 12/S.S.S.3	295	20.8%
Total	1420	100

From the table above, 675 respondents (47.5%) were Year 10/S S 1 students, while 450 respondents (31.7%) were Year 11/S S 2 students and 295 respondents (20.8%) were Year 12/S.S.S 3 students.

4: What is the type of your school?

Response	Frequency	Percentage (%)
Public	650	45.8%
Private	770	54.2%
Total	1420	100

From the table above, 650 respondents (45.8%) were students from two (2) public secondary schools while 770 respondents (54.2%) were students from three (3) private secondary schools.

5: Parents' Highest Educational Qualification?

Response	Frequency	Percentage (%)
No formal education	325	22.89
Primary school	385	27.11
Secondary school	260	18.31
Tertiary education	450	31.69
Total	1420	100

6: Parents' Occupation?

Response	Frequency	Percentage (%)
Civil servant	235	16.55
Businessperson	268	18.87
Farmer	263	18.52
Artisan	435	30.63
Unemployed	219	15.42
Total	1420	100

B. ANALYSIS OF PARENTAL INVOLVEMENT

7: How frequently do your parents or guardians assist you with your mathematics homework?

Response	Frequency	Percentage (%)
Never	380	26.8
Rarely	235	16.5
Sometimes	455	32.1
Often	165	11.6
Always	185	13.0
Total	1420	100

From the table above, 380 respondents (26.8%) were never assisted, 235 respondents (16.5%) were rarely assisted by their parents, 455 respondents (32.1%) were sometimes given assistance, while 165 respondents (11.6%) were often guided or assisted and 185 respondents (13.0%) was always assisted.

8: Over the past month, how frequently have your parents or guardians participated in school settings or events pertaining to your mathematics education?

Response	Frequency	Percentage (%)
Never	55	3.9
Rarely	128	9.0
Sometimes	550	38.7
Often	327	23.0
Always	360	25.4
Total	1420	100

From the table above, 55 respondents (3.9%) parents or guardians never participated in school meetings pertaining to mathematics education, 128 respondents (9.0%) parents rarely participated, 550 respondents (38.7%) parents sometimes participated, while 327 respondents (23.0%) parents often participated and 360 respondents (25.4%) parents participated regularly.

9: How often do your parents or guardians engage in discussions with you regarding your mathematics grades or academic progress?

Response	Frequency	Percentage (%)
Never	755	53.2
Rarely	154	10.8
Sometimes	215	15.1
Often	140	9.9
Always	156	11.0
Total	1420	100

From the table above, 755 respondents (53.2%) parents or guardians never engaged their wards in discussions regarding mathematics grades or academic progress, 154 respondents (10.8%) parents rarely discussed, 215 respondents (15.1%) parents sometimes discussed, while 140 respondents (9.9%) parents often discussed and 156 respondents (11.0%) parents discussed regularly.

10: How frequently do your parents or guardians encourage you in mathematics practice outside of the school environment?

Response	Frequency	Percentage (%)
Never	455	32.0
Rarely	245	17.3
Sometimes	365	25.7
Often	105	7.4
Always	250	17.6
Total	1420	100

From the table above, 455 respondents (32.0%) parents or guardians never encouraged their wards in mathematics practice outside of the school environment, 245 respondents (17.3%) parents rarely encouraged, 365 respondents (25.7%) parents sometimes encouraged, while 105 respondents (7.4%) parents often encouraged and 250 respondents (17.6%) parents encouraged their wards regularly.

11. To what extent are your parents or guardians engaged in assisting you in locating supplementary resources (such as texts, tutoring or online tools) to enhance your mathematics skills?

Response	Frequency	Percentage (%)
Not Involved	550	38.7
Slightly Involved	355	25.0
Moderately Involved	160	11.3
Very Involved	305	21.5
Extremely Involved	50	3.5
Total	1420	100

From the table above, 550 respondents (38.7%) parents or guardians were not involved in assisting their wards to locate supplementary resources, 355 respondents (25.0%) parents were slightly involved, 160 respondents (11.3%) parents were moderately involved, while 305 respondents (21.5%) parents were very much involved and 50 respondents (3.5%) parents were extremely involved.

C. ANALYSIS OF ATTITUDES TOWARDS MATHEMATICS IN SOLVING CHEMISTRY PROBLEMS

12: How confident are you in using mathematics to solve chemistry problems?

Response	Frequency	Percentage (%)
Very Unconfident	425	29.9
Unconfident	252	17.7
Neutral	301	21.2
Confident	287	20.3
Very Confident	155	10.9
Total	1420	100

From the table above, 425 respondents (29.9%) feel very unconfident in their mathematics abilities, 252 respondents (17.7%) feel unconfident, 301 respondents (21.2%) feel neutral, while 287 respondents (20.3%) feel confident and 155 respondents (10.9%) feel very confident.

13: Do you enjoy solving chemistry problems that require mathematical skills?

Response	Frequency	Percentage (%)
Yes	520	36.62
No	900	63.38

14: How confident are you in using mathematics to solve chemistry problems?

Response	Frequency	Percentage (%)
Not at all	510	35.9

A little	387	27.3
Moderately	220	15.5
Very much	205	14.4
Extremely	98	6.9
Total	1420	100

From the table above, 510 respondents (35.9%) do not in any way enjoy using mathematics to study chemistry problems, 387 respondents (27.3%) enjoy studying the subject a little, 220 respondents (15.5%) moderately enjoyed it, while 205 respondents (14.4%) enjoy studying it very much and 98 respondents (6.9%) extremely enjoy studying the subject.

15: How often do you face difficulties in applying mathematics to chemistry?

Response	Frequency	Percentage (%)
Not at all stressed	85	6.0
Slightly stressed	246	17.3
Moderately stressed	150	10.6
Very stressed	401	28.2
Extremely stressed	538	37.9
Total	1420	100

From the table above, 85 respondents (6.0%) don't in any way feel stressed about their mathematics assignments, continuous assessments and exams; 246 respondents (17.3%) are slightly stressed; 150 respondents (10.6%) are moderately stressed; while 401 respondents (28.2%) are much stressed and 538 respondents (37.9%) are extremely stressed as well.

16: Do you believe parental involvement has helped improve your mathematics skills in chemistry?

Response	Frequency	Percentage (%)
Not at all	410	28.9
A little	230	16.2
Moderately	302	21.3
Very much	270	19.0
Extremely	208	14.6
Total	1420	100

From the table above, 410 respondents (28.9%) don't in any way believe that their parents/guardians involvement affects their attitude towards mathematics, 230 respondents (16.2%) believes that there is minimal effect, 302 respondents (21.3%) are moderately affected, while 270 respondents (19.0%) are affected to a large extent and 208 respondents (14.6%) believes that they are extremely affected.

D. ACADEMIC PERFORMANCE IN MATHEMATICS AND CHEMISTRY

17: What is your average score in mathematics in the last term?

Response	Frequency	Percentage (%)
Much worse	515	36.3
Worse	405	28.5
About the same	297	20.9
Better	105	7.4
Much better	78	5.5

From the table above, 515 respondents (36.3%) current performance in mathematics compared to other subjects have dramatically worsened, 405 respondents (28.5%) performance have deteriorated, 297 respondents (20.9%) performance are about the same, and while 105 respondents (7.4%) have better performance and 78 respondents (5.5%) performance are much better.

18: What is your average score grade in chemistry in the last term?

Response	Frequency	Percentage (%)
A	102	7.2
B	250	17.6
C	115	8.1
D	200	14.1
E	753	53.0

From the table above, 102 respondents (7.2%) most recent grade is A, 250 respondents (17.6%) had grade B, 115 respondents (15.2%) scored C, while 200 respondents (21.1%) had grade D and 753 respondents (53.0%) scored F.

19: Have your mathematics skills helped you improve your performance in chemistry?

Response	Frequency	Percentage (%)
Yes	960	67.61
No	460	32.39

Total	1420	100

In considering the use of mathematical skills to improve performance in chemistry, higher percentage of 67.61 % acknowledged 'Yes' but 32.39 % of the students said 'No'.

20: In your opinion, what challenges do you face when applying mathematics in chemistry?

Response	Frequency	Percentage (%)
Lack of parental support	225	15.85
Difficulty understanding mathematical concepts	395	27.82
Poor teaching methods	175	12.32
Lack of study materials	415	29.23
Others	180	12.68
Total	1420	100

In the above table, in applying mathematics methods in chemistry, significant percentage (29.23 %) indicated lack of study materials, 27.85 % shows difficulty in understanding mathematical concepts, 15.85 % lack parental support, while a considerable percentage of 12.32-12.68 show poor teaching methods and other factors, respectively.

21: How often do you ask your parents/guardians for help with mathematics when you encounter difficulties?

Response	Frequency	Percentage (%)
Never	605	42.6
Rarely	310	21.9
Sometimes	205	14.4
Often	178	12.5
Always	122	8.6
Total	1420	100

From the table above, 605 respondents (42.6%) do not in any way sought for help with mathematics when they encounter difficulties, 310 respondents (21.9%) rarely ask for help, 205 respondents (14.4%) sometimes decide to seek for help, while 178 respondents (12.5%) often sought for help, and 122 respondents (8.6%) sought for help on a regular basis.

VI. DISCUSSION

Effect of Parental Involvement on Students' Mathematics Performance

1. Demographic Study

The demographic response data from the study shows the age distribution of students within the Ilesa East Local Government Area, revealing that a major part (45.77%) of the respondents is aged 12-13 years. This age group is important for cognitive and social development, as children begin to transition into more structured academic environments. Research study shows that during these formative years, (12-13), parental involvement is highly impactful, as parents who strongly engage in their child's education bring about better academic results (10). In this study, the predominance of female students (58.10%) compared to male students (41.90%) also shows that there may be varying dynamics in parental academic support based on gender, in which literature has suggested that boys may have less parental involvement relative to their female counterparts (30).

However, on the basis of type of schools involved, the data shows a near-even split between public (45.8%) and private (54.2%) schools. This outcome shows the introduction of varying resources and parental expectations into the equation. The provision of conducive learning environment, which encourages mathematical development, is more pronounced in private schools due to their structured nature (20). Therefore, understanding the major differences in parental academic engagement and support across school types can be use as an essential tool in analyzing students' achievement in mathematics and chemistry, as parental expectations often corroborates academic performance.

2. Parental Highest Qualification and Occupation

The data distribution shows that 31.69% of parents have attained tertiary education, and 22.89% have no formal education. This educational difference plays a critical role in the capacities of parents to render academic support. Research studies have constantly shown that higher level of education of parents is proportional to more effective assistance in children's

academic endeavors (6). On the other hand, children whose parents have low educational qualifications background may liable to have difficulties in mathematical assignments due to the ineffective engagement on the part of their parents, further challenging students who require guidance in this foundational area (28). This is very important as mathematics skills are a starting material for success in solving chemistry problems, which always depend on mathematical reasoning.

In addition to the socio-economic factors through the occupations of parents, that may influence academic achievement of students, were studied and notable data was provided. From a study, 30.63% of parents work as artisans or as farmers, which may affect the parents' availability and capacity to assist children in academic matters (22). Parents' that are less busy with their working hours may have more time to get involve in their child's education, while those that are too busy with their occupational working hours may a difficulty to engage their children after school hours due to time constraints. Therefore, the relationship between socioeconomic statuses, parental education, and the frequency and quality of parental involvement in academic tasks require further study.

3. Analysis of Parental Involvement and Student Performance

The responses from the questionnaire on the parental engagement indicate an important divide in frequent assist offered by parents with their children mathematical assignments. A significant percentage of 43.3% of students showed that their parents either "never" or "rarely" assist, which can have detrimental effect on confidence and competence of students' in the subject, mathematics (18). Furthermore, parents sometimes assist 32.1% of students with their mathematics assignments, showing the need for increased parental involvement in providing academic support. Such gaps in parental engagement have become necessary in mathematics and chemistry, where confidence and skill development are interconnected (3).

The 38.7 % of parents' responses towards engagement in school settings show a modest participation classified as "sometimes" engagement. However, only the percentage of parents that never take part in school settings is 3.9%, a figure that should be seen in a positive aspect, as strong engagement typically fosters better academic performance among children (16). Conversely, 53.2% of students noted that their parents never engage in discussions pertaining academic progress, underscoring an important opportunity for both parents and educators to enhance communication. Consequently, improvement in academic achievement in mathematics and chemistry can be achieved by fostering an environment that advocates for parental involvement in educational settings.

4. Analysis of Attitudes towards Mathematics in Solving Chemistry Problems

In assessing students' confidence in using mathematics to solve chemistry problems, it is reported that 29.9% described as very confident, but 35.9% did not feel confident at all. This inconsistent in confidence statuses may be directly brought about by the extent of parental engagement, which, as earlier discussed, significantly corroborates with overall academic performance of students' (18). Researchers have shown that encouragement and support received by students from their parents lead to the development of more positive attitude towards difficult subjects such as mathematics, which is foundational part for chemistry problem-solving (14). Thus, the interconnection between perceived assistance offered by parents towards their children's academic achievements and students' self-confidence in these subjects necessitate the principal role of strong parental involvement.

Furthermore, 63.38 % of students do not found it easy in solving chemistry problems which require mathematical skills. Academic motivation of students and, consequently, their success are affected by their enjoyment and interest in the subjects, which are key components (8). As a result of this, students may have disconnect between their mathematics skills and their application in chemistry, which can easily leads to decrease enjoyment and further increment in anxiety around these subjects (28). Moreover, the significant percentage of students (37.9%), who feel extremely stressed by applying mathematics to chemistry must be studied, as higher stress levels can negatively affect engagement and lower academic achievement.

In addition, the question of whether students believe parental involvement has improved their mathematics skills related to chemistry provided mixed reactions. While 28.9% of students noted that parental engagement has not assisted at all, 19% felt it has helped significantly. This difference shows that parents may not have full information of their impact in engaging their children with mathematics within a chemistry context (7). Parental education about effective methods for assisting their children in learning mathematics can results in overall success, which in turn enhances mathematical skills application in solving chemistry problems.

5. Academic Performance in Mathematics and Chemistry

A decline trend was observed the on students' average scores in mathematics. The data reported that 36.3% of the students have a decline in their performance while 7.4% showing an improvement. In an academic study, proficiency in mathematics determines the success in scientific disciplines; therefore, such results reflect the critical relationship between mathematics and chemistry (4). The score obtained point towards significant anxiety among students, possibly starting from limited parental involvement in their academic progress, further requesting a robust response from both educators and families (7).

Furthermore, about 67.71% of students agreed that their mathematics skills help in increasing their chemistry performance, the present study also shows that 32.39% of the students do not see this correlation, highlighting a study gap in foundational understanding that needs attention (13). Discussions around these results indicate the importance of energizing the link between mathematics proficiency and chemistry success during instructional period, ideally with comprehensive parental support to facilitate a better comprehension of these subjects (14).

VII.

Problems identified by students on the application of mathematics skills in chemistry show basic issues that educators need to study and address. The lack of study materials noted by 29.23% of students and 27.83 % of the students acknowledge difficulties in comprehending mathematical concepts, it is now evidently true that systemic changes and allocation of resources are pertinent to support students effectively (17). The major goal should be to provide an environment that promotes parental educational engagement while addressing educational problems or differences, thus enhancing both students' mathematical capacities and their subsequent performance in chemistry.

CONCLUSION

In this present study, it has been shown that parental involvement is critically related to the performance of students in mathematics and their ability to solve chemistry problems. The demographic analyses show a various educational background of parent, occupations, and involvement in activities related to education, which significantly impacts the students' academic achievements and experiences. A significant number of students report problems relating to the usefulness of mathematical skills in chemistry, which were compounded by limited or inconsistent parental engagement.

Students' confidence and motivation significantly influenced by fostering positive parental attitudes and proactive engagement. Methods should be developed to educate parents about effective ways to support their children's educational learning, especially in mathematics and its application of mathematical skills in chemistry. Moreover, by solving the issue of the stresses faced by students and improving communication regarding their academic records can result to enhancing the performance outcomes. Ultimately, the findings reinforce the need for collaborative efforts among educators, parents, and students to create a supportive educational environment, particularly in contexts like Ilesa East, Osun State, Nigeria, where various socio-economic factors come into play.

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