

Review

Effects of parental involvement on students' attitude and performance in science

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This paper examines the attitude of students towards Biology and Chemistry. There was also a focus on the parental involvement. This research was set out find out how parental involvement influences students' attitude towards, and performance in the two science subjects. An attitude questionnaire developed and standardized by the researcher was used. It's split-half reliability coefficient yielded 0.59 and 0.51 for Biology and Chemistry respectively. A sample of four hundred and eighty students participated in the study. Three hypotheses were raised and tested. The result obtained using chi-square analysis revealed that the level of the home influence has implication on school learning and that performances of students in science are a function of their attitudes to the subject. The phenomena observed were discussed in the light of prevailing conditions in most of the developing West African countries. Conclusively, home influence can be a tool to enhance school learning.

Key words: Attitude of students, biology, chemistry, parental involvement, performance, level of the home influence, influence of parental involvement.

INTRODUCTION

Home influence can be identified as very important variable that have potential for promoting directly or indirectly student academic achievements (Fehrmann et al., 1987; Blooms, 1984). The term parental involvement has been given different meanings. It has been used to mean parental expectation of school performances, (Hess et al., 1984; Seginer, 1983); deliberate effort by the home to reinforce improved academic performance (Fehrmann et al., 1987; Fontana, 1981; Karraker, 1972); general academic guidance and support (Blooms, 1984); students perceptions of the degree to which their parents influence their plan for high school and monitor their daily activities and school progress (Oguntelure, 1987; Keith and Page, 1985a), parental influence as determinant of attitude towards learning, (Oguntelure, 1987), contribution to children's activities (home work, encouraging children to read), and promoting school and school based activities (attending parent teachers' association meetings, parent teachers conference and participating in fund raising activities (Olatoye and Ogunkola, 2008). Aghenta (1982) identified four major factors responsible for poor.

performances in science subjects. These factors are;

- (i) Teacher related (e.g. bad teaching, unpleasantness). IDEA (2004) emphasizes that better learning achievements of students is ultimately determined on the classroom by motivated teachers who have the skills and recourses to respond effectively to students' learning needs.
- (ii) Pupil related (e.g. socio cultural background that is indifferent to the learning of science. (Olugbemiro et al., 2004), attitudes, interest, and learner related influences e.t.c) According to Olatoye and Ogunkola (2008) the cooperation of students, their parents and teachers can be very valuable.
- (iii) Authority related (e.g. poor management, wrong priority, vision, standards, incentives, curriculum etc).
- (iv) Subject content related e.g. difficult concepts.

The major concern of this research is to looks into parental influence on the attitude and academic performance among post primary school students. In spite of the fact that observable attitude of the student have been produced by combination of variables, as earlier mentioned, it is possible to identify the effect of "home influence" on attitude, enrolment and performance in

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science. If this psychological construct called attitude, having been mentioned as one of the three main factors affecting performance in science (Agenta, 1982); it is important to find out if there is any relationship between it and parental influence. Can positive influence from parents and interested members of the public help to produce enough science-oriented students to read science based courses and provide manpower in the new science areas of science based occupations?

Attitude

Attitude is a concept, which arises from the attempt to account for the observed regularities in the behavior of individual persons, the quality of which is judged from the observed evaluative responses one tends to make. An individual can show positive or negative attitude towards a particular object, subject or idea. Kind et al. (2007) viewed attitude as having different components which includes cognitive (knowledge, beliefs and ideas); affective (feeling, like, dislike,) and behavioural (tendency towards an action). The attitude that one has towards an object makes one to make judgment as to whether the object is good or bad, harmful or beneficial, pleasant or unpleasant, important or unimportant, Crano and Prislin (2006). Epstein (1995) identified six areas of parental involvement in their children's academic activities. These are parenting, communicating, volunteering, learning at home, decision making and collaborating with the school. According to him, if they are actively involved in all these areas, no doubt it will stimulate in school and influence academic achievements. Due to the great influence of attitude on educational pursuits, it is worthwhile to identify the determinants of attitude towards a particular object, subject or idea, the chief of which are hereditary factors, body, state, direct experience and communication. Hereditary factors (that is, inheritance from parents) form the basis of all human activities including developing of attitude as well as learning. Sometimes unconsciously parents and guidance through non-verbal communications transfer their fear, likes and dislikes to children via bodily movements and facial expression.

Parental Involvement

Children who are academically successful hold positive attitude school and are well adjusted emotionally and socially (Jeynes, 2005). The academic success is due to the children's innate abilities and reflects the advantage of being in the socio economic level (Machen, Wilson and Notar 2005). Children who are economically advantaged receive enough stimulation at home thereby enhancing their academic achievement (Dearing et al., 2006; McWayne et al., 2004b). Parents' high aspiration does have additional benefit over and above the advantages

children enjoy from being capable and receiving adequate stimulation and resources. One study found that higher level of parental aspiration lowered the likelihood of academic failure during primary school by 48% compared with equally poor but low aspiring parents (Machen et al., 2005; Stelios et al., 2007; Zhao and Akiba, 2009).

Puph and De'Ath (1989) identified five dimension of parental involvement, these are:

- (i) Non-participation - Parents are not involved in their children's learning. These active non-participant parents may have decided not to be involved. They may either be satisfied with what the school is offering, or are too busy at work, or want time away from their children. Some of the parents passive simply because they lack confidence or may be unhappy with the form of partnership the school offers.
- (ii) Support - This dimension of parental involvement occurs only when parents are invited to attend events, e.g. parent/teachers' meeting, contributing to developing school policies, or by providing money for learning resources. This is a form of direct involvement.
- (iii) Participation - Parents may wish to participate as helpers providing assistance on outings, running a toy library, supporting children's learning in the setting and providing indirect support at home that is, keeping informed about what happens to their children at school, monitoring their academic progress, reading to them and providing intellectually stimulating activities for them at home and within the community.
- (iv) Partnership - This dimension of parental involvement is a wide scope comes in form of partnership with practitioners. As a result of equal access to information and records some parents may share in the diagnosis and assessment of their children, or involve in the selection of practitioners, or become parishioners.
- (v) Control - In this case, parents determine and implement decisions.

Direct experience by learners is one of the most important determinants of attitude. Parents/guardians need to influence their children by increasing familiarity in the science subject, taking interest in their school work, enroll them for extra lessons, ensuring that home work is done, acquire film and other electronic material that can stimulate their interest in science based careers and enable the children to develop friendly attitude towards the science subject. These experiences are effective in removing hostility towards schoolwork. The effectiveness with which parents are able to motivate their children to learn science by way of enhancing their home and school learning environments is a function of their socio-economic status. The fact that there is a positive relationship between parental influence, which is an index of socio-economic status of parents and the academic progress of their children is established by Lee and

Croninger (1994); Willms (1986); Sui-chu and Willms (1996); Oluwatelure (2009).

Our modern society is faster paced, globally networked, technologically oriented and requires workers who can solve problems and think critically. The Americans believed that poor ability in science, mathematics, and technology will certainly hamper their leading role in the global village Knuth et al. (1991). Hence the initiative that lead to the creation of a community-based collaborative approach, involving the family-school-community partnership, to establish "after school programme", which was meant to improve the whole child. The negative attitude of Nigerian students which is confirmed by poor performance in science; (Olatoye, 2004b; Ogunniyi, 1996); needs to be reinforced through collaborative efforts of parents/guardians, communities and the school. Parents, irrespective of their economic status, are important stakeholders in the education sector and can actually challenge the incompetent nature of science teacher, lack of commitment as well as the slow national approach to science education reform.

In the quest for quality education in Africa, (ADEA, 2003 and 2004) challenged the participants to focus on ensuring that schools are effective in creating a supportive environment for teachers and for classrooms where all students have the opportunity to acquire the knowledge, the skills, the attitudes specified in the curriculum. In the year 2006 edition of the IDEA biennial meeting, the impact of early childhood programme on later school performance and in the preparatory of children for formal schooling. They also found that literate parents will actively support the education of their children. There is an emphasis on the culture of quality as the only avenue through which schools in Africa can develop and survive. There is the belief that centralization should give way to parental and civil society participation. It was reported that in the exploration of nine countries in Africa, little parental or civic involvement was found. Parents and community participation in the Sub Sahara African schools, is seen as a key element of success (Dalin, 1994).

Statement of problem

Vast majority of parents are finding it more and more difficult to make a living, especially in developing and underdeveloped countries; scarcity of food especially due to its diversion to the production chemicals, drugs and ornaments present enough reason to be distracted from the expected monitoring in various aspects of children's life. The challenges of single parenthood, family crises and the ever increasing involvement of women in various areas of community and national development makes one to ask questions as to whether parents are still able to be committed to their wards; or whether they are putting enough efforts towards effective learning of science among children.

This research work therefore seeks to find out the extent to which parents have been able to objectively use their position to enhance academic progress in their children.

Purpose of the study

If parental influence becomes exerted on pupils through inheritance and communication and by providing right and stimulating environment, the main focus of this research is therefore to find out if there is home/social class advantage. In other words, this study was geared towards finding out if positive attitude as well as academic progress of students from parents with high involvement will be better than their counterparts from parents with low involvement. The researcher also seeks information as to whether there will be any relationship between attitude to and performance in science.

Research questions

Four research questions were raised to pilot the study. These are:

1. What will be the mean attitude (Biology) for each of three categories of parental involvement?
2. What will be the mean attitude (Chemistry) for each of three categories of parental involvement?
3. What will be the mean performance (Biology) for each of three categories of parental involvement?
4. What will be the mean performance (Chemistry) for each of three categories of parental involvement?

Research hypotheses

The following hypotheses were raised to guide the study.

1. There will be no significance difference in the attitude score of respondents with respect to the level of their parental involvement.
2. There will be no significance difference in the performance of respondents in science with respect to the level of their parental involvement.
3. There will be no significant relationship between the attitudes and academic performance of respondents in science.

Sample and sampling technique

Four hundred and eighty students (480) randomly selected from ten secondary schools stratified proportionately into four; rural and urban; long established and newly established; in Ekiti State, Nigeria; among the final year students offering science.

Instruments/administration

An attitude questionnaire designed and standardized by the researcher (split half reliability coefficient 0.59 and 0.51 for Biology and Chemistry respectively) was administered to determine the attitude of senior secondary school student towards two of the science subjects namely: Biology and Chemistry.

In exploring this attitudinal construct, items were drawn relating to concepts which are important components of the attitudinal measures considered in this research. They were Likert scale item type questions, in which respondents choose from 5-point scores such as strongly agree (SA), agree (A), undecided (U), disagree (D), strongly disagree (SD).

- (i). Interest or enjoyment of the subject.
- (ii). Perception of the subject.
- (iii). Perception of value of subjects (that is, usefulness).
- (iv). Assessment and performance (that is, ability).
- (v). Attitude towards teachers teaching the subject.
- (vi). Attitude towards content of the subject.
- (vii). Outside pressure (that is, home influence).
- (viii) Attitude towards self (that is, positive or negative relation to subject)
- (ix). Fear and anxiety.

The questions which were responded to under home influence were related to:

- (i) Extra lesson/home work.
- (ii) Occupational/status of parents.
- (iii) Educational level of parents.
- (iv) Possession in the home.
- (v) Leisure.
- (vi) Time spent on domestic and commercial affairs.

The total number of items in the questionnaire was fifty eight and they all measured the same construct.

Thirdly, information concerning the individual performance (in percentages) of respondents was obtained from their continuous assessment records of the school subjects concerned (that is, Biology and Chemistry). Copies of the questionnaire were administered to the respondents by the researcher and collected from them immediately after completion.

Scoring

The questionnaires were scored using the Likert system. For positive statements, responses were assigned 4, 3, 0, 2 and 1 as the scores for choosing SA, A, U, D, or SD respectively, while negative statements were scored in the reversed order, and the summed scores obtained for each respondent. The items under home influence were scored separately, converted into percentages and ranged into three categories, high (100-66.5), and ave-

rage (66.6-33.4), and low (33.3-0). The attitude scores of the respondents were then sorted out with respect to the categories.

Analysis

The data obtained were analyzed using Analysis of variance (ANOVA) for hypotheses 1 and 2 and Pearson product Moment correlation coefficient for hypotheses 3. Descriptive statistics was also employed so as to provide answers to the research questions raised in the research.

RESULT

The result obtained was presented in Tables 1-4 and Figures 1, 2, 3 and 4 Pearson product Moment correlation coefficient 'r' is 0.68 for Biology, Pearson product Moment correlation coefficient 'r' for is 0.65 for Chemistry both at 0.05 level of significance.

DISCUSSION

The phenomena as revealed the tables of results and the figures are discussed below. In Table 1 and 2 there was a significance difference in the attitude of respondents towards biology and chemistry with respect to the level of their parental involvement. This is in line with the findings of Lee and Croninger (1994); Willms (1986); Sui- chu and Willms (1996); Oluwatelure (2009) who believe that an effective collaboration between parent teachers and the community will effectively remove hostility towards schoolwork, motivate children to learn science by way of enhancing their home and school learning environments. Olatoye and Ogunkola (2008) was also in support of the fact influence of parental involvement enhances achievement in science. In Tables 3 and 4, it was also observed that, there was a significant difference in the performance of respondents in the two subjects with respect to their parental involvement. In other words, the hypothesis of no difference was rejected, at 0.05 level of significance. The fact that there is a significant difference in the attitude and performance of respondents due to parental involvement is supported by Sukon and Jawahir who observed that home related factors affects numeracy performance. They also confirmed that level of education of parents, availability of reading materials at home, home possession, parental support in education, familiarity with English at home are major factors causing variation in students achievement.

In addition, there was a high level of dependence between attitude and performance among the three categories of learners. This was supported by Serin and Mohammadzadeh (2008), who found out in their study that there was a meaningful relationship between stu-

Table1 ANOVA in which the Attitude of respondents towards Biology was pitched against the level of involvement of their parents.

Attitude towards biology

	Sum of Squares	df	Mean Square	F	F-Table.
Between Groups	22163.738	2	11081.869	233.532	4.79
Within Groups	22635.244	477	47.453		
Total	44798.981	479			

233.53 > 4.79 table value 0.05 level of significance; hence the null hypothesis was rejected

Table 2. ANOVA in which the Attitude of respondents towards chemistry was pitched against the level of involvement of their parents.

Attitude towards chemistry

	Sum of squares	df	Mean square	F	F-Table
Between Groups	32823.988	2	16411.994	203.940	4.79
Within Groups	38386.338	477	80.475		
Total	71210.325	479			

203.94 > 4.79 table value 0.05 level of significance; hence the null hypothesis was rejected.

Table 3. ANOVA in which the performance of respondents in biology was pitched against the level of involvement of their parents.

Performance in biology

	Sum of squares	df	Mean square	F	F-able
Between Groups	9110.129	2	4555.065	35.119	4.79
Within Groups	61869.119	477	129.705		
Total	70979.248	479			

35.12 > 4.79 table value 0.05 level of significance; hence the null hypothesis was rejected.

Table 4. ANOVA in which the performance respondents in chemistry was pitched against the level of involvement of their parents.

Performance in chemistry

	Sum of squares	df	Mean square	F	F-table
Between Groups	15259.467	2	7629.733	112.139	4.79
Within Groups	32454.125	477	68.038		
Total	47713.592	479			

112.12 > 4.79 table value 0.05 level of significance; hence the null hypothesis was rejected

dents' attitudes towards science and their science achievement. Parents, irrespective of their economic status would want their children to succeed in school learning and want their children to take up career that will enhance their placement in the future. The outcome of this research work revealed that this expectation might not materialize. Similar studies carried out among student in the advanced countries of the world such as United States of America and Britain, confirm this phenomenon (Lareau, 1989; Fehrmann et al., 1987; Williams et al.,

1982; Pearson et al., 1982; Kenny, 1979).

The graphical illustrations revealing the impact of parental involvement on attitude and performance can be found in Figures 1 to 4. They provide adequate answers to the research questions raised in this study. It was observed that respondents with high parental involvement had the highest means in both attitudes and performance scores for both chemistry and biology. The next highest set of mean scores belong to those respondents with average parental involvement except chemis-

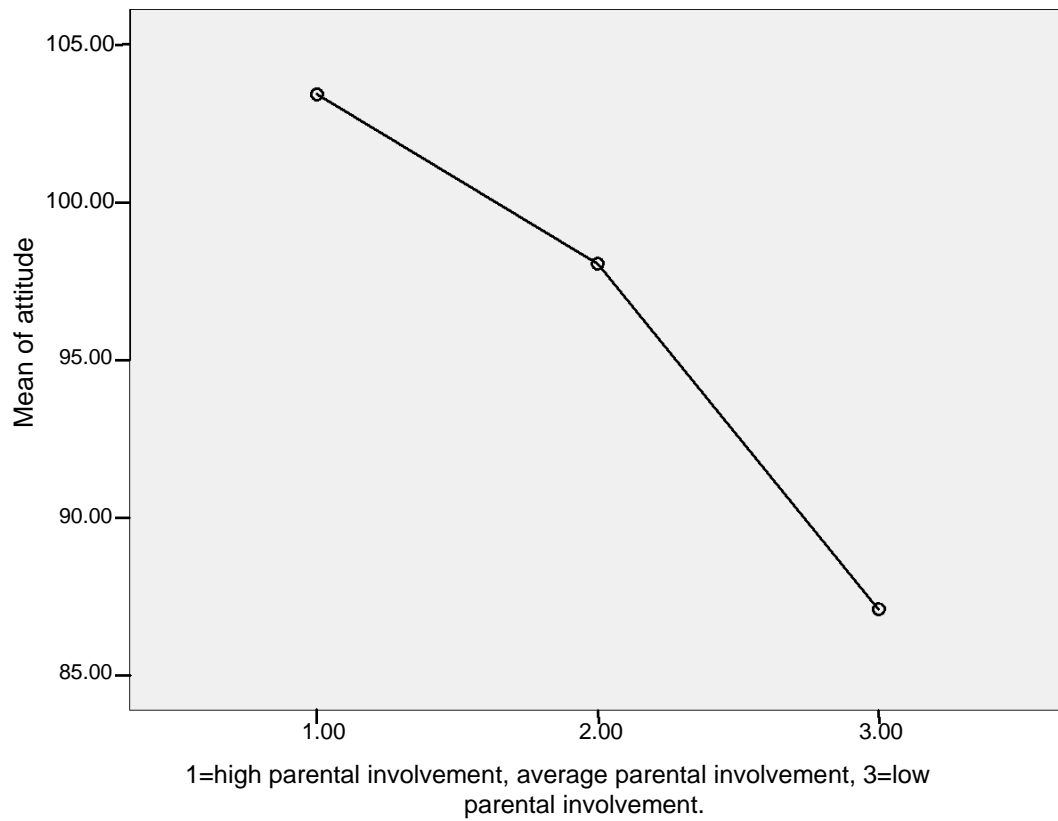


Figure 1. Shows the impact of parental involvement on the mean attitude of the respondents towards Biology.

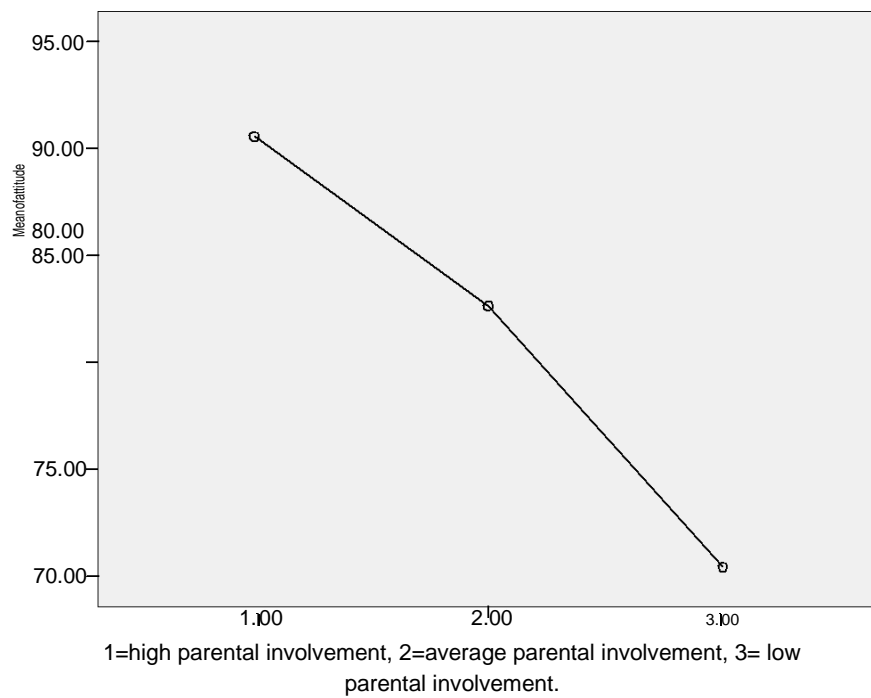


Figure 2. Shows the impact of parental involvement on the mean attitude of the respondents towards Chemistry.

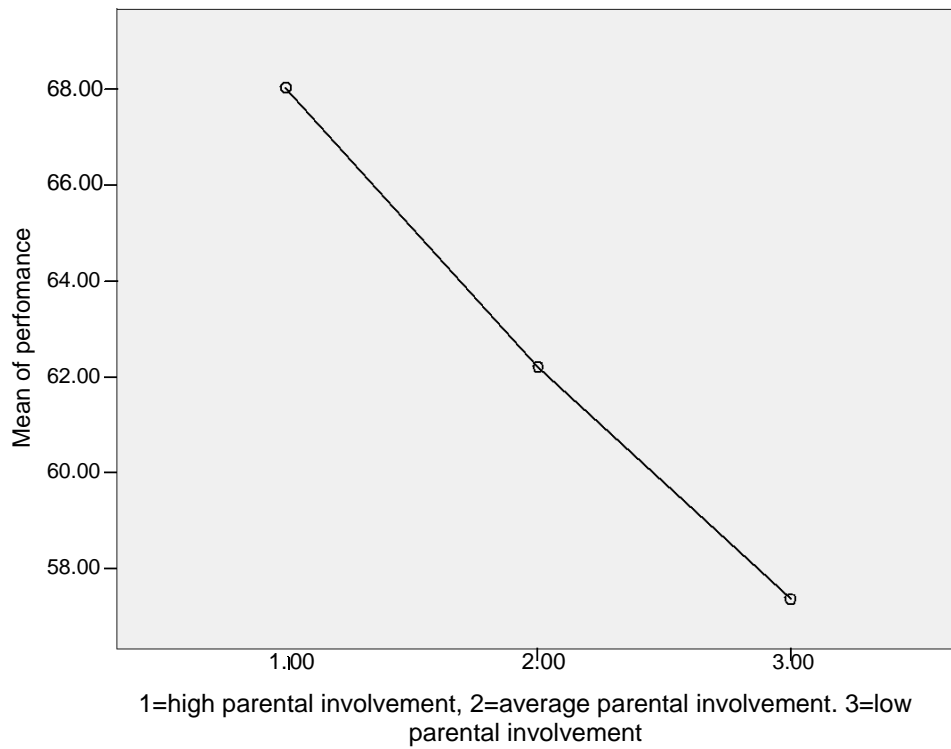


Figure 3. Shows the impact of parental involvement on the mean performance of the respondents in Biology.

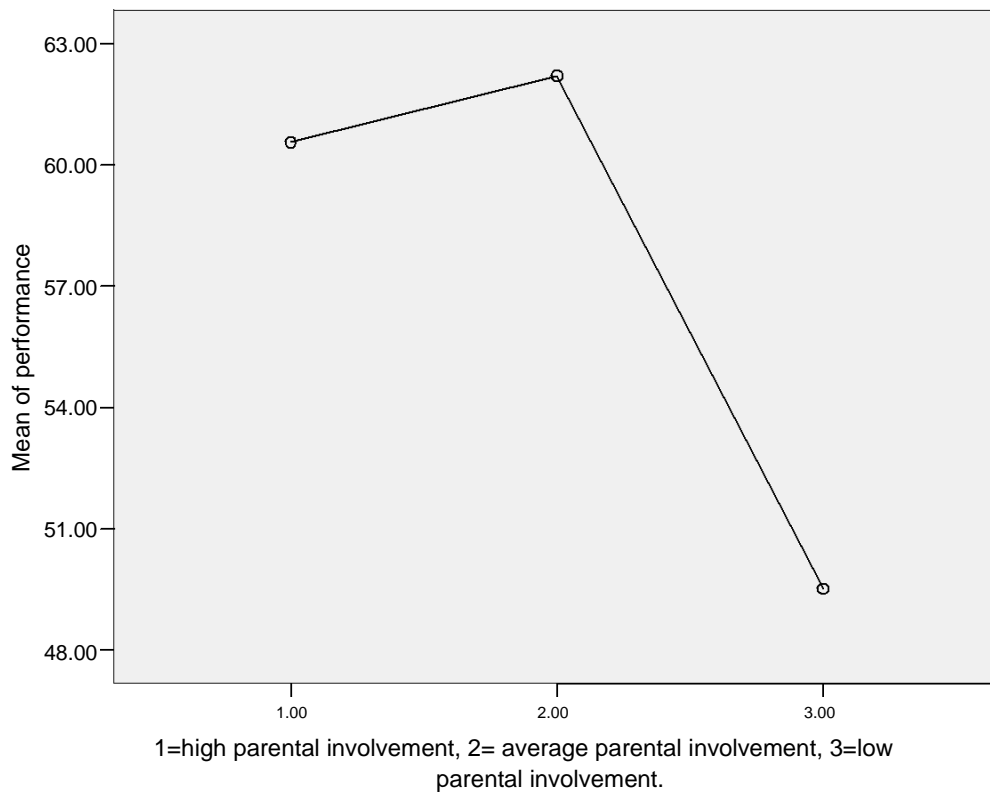


Figure 4. Pearson product Moment correlation coefficient 'r' for is 0.65 for Chemistry both at 0.05 level of significance.

try performance in which the mean score for the average group was slightly higher than the mean for the high parental involvement group. The lowest set of means scores belong to the respondents from parents with low involvement. This pattern of results implies that the higher the involvement of parents the better the attitudes of students towards science and the higher the academic success of such students in science. This research outcome is corroborated by Olatoye and Ogunkola, (2008), whose opinion is that the lukewarm attitude towards school learning as well as low aspiration on the part of some parents is transferred to their children. Their children are not encouraged to go into private lessons promptly and regularly. It is therefore difficult for these children to make meaningful academic progress.

Conclusion

In conclusion, a greater academic progress can be achieved by students if their parents become conscious of the fact that there is a lot they can do to bring to reality their goals and aspiration for their children. Indeed the type attitude and performance in science subjects is a function of the level of parental involvement.

Recommendation

In view of the importance of parental involvement to academic progress, it is important that school authorities should seek for means of ensuring that the attitude of parent and guidance are influenced positively towards assisting the students, so that they in turn can put in their best into their school work.

Also, parents and teachers should be made to realize the importance of science learning to the individual (that is, scientific literacy) and to the society (technological advancement). This research has a potential to increase the understanding of the way Nigerian and indeed African school can move towards increased effectiveness by providing quality learning opportunities at the school level.

School authorities need to organize programs that will bring about parents, teachers and student interaction. This will create a forum for discussion. In this manner, parent will know what they are expected to do to complement teachers' efforts and vice versa. Schools also need to make such programmes attractive to parents.

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