

Influence of Peer Group on Students' Motivation and Academic Performance of Chemistry Students in Secondary Schools in Ekiti State, Nigeria

¹Adebisi O. AWODUN (Ph.D) & ²Amoke M. KENNI

^{1,2}Department of Science Education, Bamidele Olumilua University of Education, Science and Technology, Ikere- Ekiti, Ekiti State, Nigeria.

¹ E-mail : bisawoideas@yahoo.com , Phone No: 08038527974,

²E-Mail: kenni.amoke@coeikere.edu.ng , Phone: 08053158669

Abstract

This study investigated the influence of peer group on motivation towards chemistry and academic performance of Chemistry students in secondary schools in Ikere Local Government Area of Ekiti State, Nigeria. The research design used for the study was survey design of the descriptive type of research. The sample size of two hundred and ten (210) respondents was sampled for the study using random sampling technique. The respondents were selected from six (6) public secondary schools in Ikere local government area of Ekiti State, Nigeria. The instrument for data collection for the study was a self-structured questionnaire. The instrument was subjected to validity and reliability mechanism. A reliability coefficient index of 0.92 was obtained. The research hypotheses were tested using inferential statistics of Chi-square (χ^2) at 0.05 level of significance. The findings of the study showed that peer group influenced students' motivation, grade level, learning styles and academic aspiration of senior secondary school Chemistry students. Therefore, based on the findings, conclusion and appropriate recommendations were made.

Keywords: peer group, motivation, academic performance, chemistry students.

Introduction

Education is universally recognized as the answer to socio- economic problems of the world. Nations and individuals look up to education to provide a cure for poverty, ignorance, drought, excessive rainfall, mental deficiency, joblessness, bad government, poor communication system, hunger and inadequate shelter among other things. Science is recognized widely as being of great importance internationally both for economic well-being of nations and because of the need for scientifically literate citizens. Education is a very important human activity. It helps any society fashion and model individuals to function well in their environment. Boit, Njoki & Chang'ach (2012) stated that the purpose of education is to equip the citizenry to reshape their society and eliminate inequality. Secondary schools not only occupy a strategic place in the educational system in Nigeria, it is also the link between the primary and the university levels of education. In the view of Asikhai (2010), education at secondary school level is supposed to be the bedrock and the foundation towards higher knowledge in tertiary institutions.

Acquisition of appropriate scientific and technological skills is necessary to cope with the challenge presented by the evolving needs of the modern work place in the industries and the ever growing non-formal sector. Science and technology have become the hall mark for sustainable development in any national economy, but cannot strive ahead without chemistry. The developed countries forged ahead by recognizing the relevance of chemistry in their

national economy. Research evidence have shown that chemistry's contribution to quality of life and nation building are worthwhile in all aspects. It was based on this that the federal government through her national policy on education made chemistry a compulsory science subject at the secondary level (NPE, 2013).

Eke (2008) posited that any nation aspiring to be scientifically and technologically developed must have adequate level of chemistry education. The contribution of chemistry and chemist to social, industrial and economics life of the world in general and Nigeria in particular has been self in all facets of human life. Umoinyang & Okpala (2001) stated that there are three societal needs which could be accomplished through the knowledge of chemistry. These are the needs for physical survival living a satisfactory economics life and raising the level of socio-cultural life. The knowledge of chemistry has enable us to produce good water, food and health care resources, various materials for construction of industries, roads, auto mobile and home in addition to solving problem resulting from human interaction with environment even though the knowledge of chemistry to the society is very important, students achievement in chemistry as measured by their scores in senior secondary certificate examination is very poor.

It is worth to emphasize at this juncture that the field of chemistry and science and technology are related to the economic heart of every highly developed industrialized and technologically advanced society (Burmeister, Rauch & Eilks, 2012). The benefit of learning and advancing in science and technology can be intrinsic and extrinsic, and such as been identified with chemistry. Teaching and learning of science have significant roles towards technological development in a developing nation since chemistry is embedded in our life and society, economical, ecological and societal influences (Hofstein, Eilks & Bybee, 2011).

Kang (2006) opined that peer group means a small group of friends which have close relations with each other and they have regular interactions. They share views and exchange ideas with each other and do activities in groups. When children take steps into the stage of adolescence, they spend a large amount of time with their friends as compared to their parents. Peer group is a group of people who are equal in some way. Those in a peer group have the same status and are about the same age. Peer group may be defined as a group of individuals through homophile share similarities such as age, background, social and political affiliations. The members of this group are likely to influence the person's beliefs and behavior. These contain hierarchies and distinct pattern of behaviour. Eighteen years old are not in a peer group with fourteen years old even though they may be even in the same school, just as teachers do not share students as a peer group.

Peer group shows strong academic attainment, such that strong CGPA, strong aspirations for college, giving much time to homework, strong temperament of competition and participation in co-curricular activities. Socialization and selection strongly contribute to homophile. Socialization is the process of influencing similar attributes of peer group on each other, while selection is the choosing process of friends (Sajjad, Riasat, Amir, Abdul, Syed & Maksal, 2013).

Salleh (2011) asserted that students were not negatively influenced by their peers in decision- making but that peer gives positive influence on their achievement in academics and make them differentiate between wrong and right. Adeyemo & Torubelu (2008) said self-efficacy, self-concept and positive peer relations were effective in predicting students' academic performance. In a study on peer influence, pupils' interest in schooling and academic achievement, Adika & Toyobo (2007) reported that both peer influence and pupils' interest correlate significantly with academic achievement. According to Burke & Sass (2011), peer effect depends on students' ability and on the ability of the peers under consideration. Peer effect tends to have smaller impact when teacher-related factors are included; a result that suggests significant combined influence of peer and teacher quality on students' behaviour. Peer effect tends to be strong at the classroom level than the grade level

(Burke & Sass, 2011). Oloyede & Olatoye (2005) reported that there was no significant relationship between peer influence and study habit; peer influence did not predict study habit; peer influence accounted for 0.0% of the total variance in adolescents' study habits; there was no significant difference between male and female adolescents both in the levels of peer influence and study habit.

The low academic performance in schools has brought the need to investigate the factors influencing learning outcome. The peer group influence is one of the factors causing low academic performance. There is need to look into peer group relationship and individual motivation to learning, grade level of students in relation to peer group, academic aspiration of Chemistry students and find out if peer group influence academic decision of students. The researcher observed that peer groups characteristics and environment where it operates, affect the behaviour and educational attainments of secondary school students in Chemistry. Variation in students' educational achievements is due to their peer group effect. It is against this background that the researcher attempt to investigate the influence of peer group on the motivation and academic performance of Chemistry students in Ikere Local Government Area of Ekiti State.

Research Hypotheses

The following hypotheses were formulated and tested at 0.05 level of significance:

1. There is no any significant influence of peer group on students' motivation towards Chemistry in secondary schools.
2. There is no significant influence of peer group on academic performance of senior secondary school chemistry students.

Review of related literature

Concept of peer group

Peer group consists of people or individuals that are within ages that are close in years, for instance between range of one to four years, the school serves as primary setting for the membership of peer group, they may be in the same class, the same sex and close interaction is of equals (Ajibade, 2016). It is generally observed that peer group has a lot of influence on students. This is seen from the role played by the peer group in the life and learning of a child, it is believed that students feel more comfortable and relaxed among fellow students (Ajibade, 2016). A child who is brilliant and surrounded by dull friends would lose interest in learning. Ajibade (2016) further stated that a peer group which inclined to study would have positive effect on a dull member towards learning and stimulate his/her interest on learning (Ajibade, 2016). The attractiveness of the group, the nature of conformity demanded by the group and the morals of the group determine whether a group is likely to have positive or negative impact on members' motivation and achievement. If the atmosphere of the group is warm, understanding and supportive, the group influence or motivation, task performance and achievement will most likely be positive (Ajibade, 2016).

A hostile atmosphere, constant frustration and frequent conflicts produce a negative impact not only on the member's growth and behaviour but also on his motivation to work and achievement. The kind of person a child is dictates the type of group he/she is in, as children tend to imitate each other. Ajibade (2016) opined that imitation of behaviour in a group occurs when a person acts in a way that is likely to be joined by the rest of the group. Through observation and imitation of behaviour of other students, learners can bypass much wasteful random behaviour and come close to reproducing the behaviours of which members are recognized. Given that adolescents spend twice as much time with peers as with parents or other adults, it is important to study the influence or pressures that peers place on each other. Ajibade (2016) asserted that adolescents spend twice as much time with peers as with

parents or other adults, it is important to study the influence or pressures that peers place on each other

Peers influence each other in several ways, though not all of them are bad, variable of peer influence in this context include the ethnicity of the student, the socio-economic background of the student, family relationship and group interest, also the positive and negative influence is going to be considered. Many peer groups can exert a positive influence on their friend. It is thought that intelligent student do help their peer bring up their academic performance. Likewise, girls with good friends who are considered intelligent tend to do better in school, all attributable to the fact that they share a common team of similar aspiration (Landau, 2017). Also there are some peer groups who can exert negative influence on their friends and these groups tend to share low aspiration of going to tertiary institution or pursuing certain careers. There may be other value in place, such as taking care of the family or making quick money rather than pursuing tertiary education first (Ide, Parkerson, Haerted & Walberg, 2006).

Concept of academic performance

Academic performance refers to the degree of a student's accomplishment in his or her tasks and studies. The most well-known indicator of measuring academic performance is grades which reflect the student's "score" for their subjects and overall tenure. Success is measured by academic performance in most educational institutions. In this case, how well a student meets standards set out by an institution itself or an external examination body either set up by the government or an independent outfit signifies success or good performance. Before standardization, teachers' observations made up the bulk of the assessment. However, standardization function which is fulfilled by establishments outside the schools helped in putting this in check considerably.

According to Adediwura & Tayo (2007) academic performance is designated by test and examination scores or marks assigned by the subject teachers. Student performance can be low, average or high. Performance of students can be affected by several factors, which can be student related factors, school related factors (teacher) and home related factors (Adediwura & Tayo, 2007). Students performance is driven by helping teachers construct learning scenario that are meaningful to individual students, relevant to their circumstances and cognizant of their prior of learning and potential. Understanding what students have achieved, where they should need next and how to effectively reach their destination requires a coordinated effort, bringing together best of breed learning and assessment tools with engaging and effective content and instruction (Otokiti, 2016).

Academic performance is used as an index of students' future in this highly competitive environment. It has been one of the most essential purpose of the educational process. Academic achievement is considered as a key criterion to judge an individual's total potentiality and capability (Abdullahi & Bichi, 2015). Academic performance is all about what student can actually do when they have finished a period of instruction. Academic performance is the level of performance that is exhibited by an individual. Anselmus (2011) asserted that academic performance is a cardinal concept in education. The centrality of this concept is derived from the goal of instructions which is to bring about desire changes in knowledge, skills and attitude of students. For example, people send their children to school in order to acquire certain competencies their preference on the attributes of interest provides an indication of the degree of efficiency of the machinery of education. In the formal school system, students' academic performance can be assessed at the main points which give rise to three types of performance assessment and these are diagnostic, formative and summative evaluation or assessment (Anselmus, 2011).

The diagnostic assessment or evaluation take place as the course commences, formative evaluation are conditions where teachers gives periodic test for example

continuous assessment exercise. While summative tests are used by classroom teachers and external examination bodies and grades are awarded. The grades of ABC and F are awarded to students according to students' performance by their teachers or examiner. The assessment competence of a teacher as identified by the association to include knowledge and skills which is critical to a teacher role as educator. By establishing standards for teachers' competence in students' assessment the association in 2000 subscribed to the view that students' assessment is an essential part of teaching and that good teaching cannot exist without good assessment. Ekeke (2013) stated that the scope of teachers' professional role and responsibilities for students' assessments may be described in terms of the following activities.

Peer group and students motivation towards Chemistry in secondary schools

Motivation is an affective factor which makes human organisms behave, determine the decisiveness and energy of that behaviour and keep the behaviours going by directing them. Motivation is a theoretical construct used to explain the initiations, direction, intensity, persistence and quantity of behavior (Ekici, 2010). Nowadays the motivation towards teaching and learning concept is often used in the literature (Yilmaz & Cavas, 2007). Example, motivation towards science (Chemistry) lesson, motivation to technology lesson, etc has generated study on the causes of failure in science classes. The success of students mostly depends on factors effective in cognitive area; but affective area skills are also important in addition to cognitive factors (Thompson & Mintzes, 2002).

Dinah (2012) stated that motivation is a process that begins with a physiological deficiency or need that activates behaviour or a drive that is aimed at a goal or incentive. Motivation therefore consisted of needs (deficiencies) which set up drives (motives) which help in acquiring the incentives (goals). Drives or motives are action-oriented while incentives/goals are those things which alienate a need. Marques (2010) opined that motivation is what people need to perform better and can only work if the right person with the right skills has been placed in charge of the task at hand.

The peer group is a source of affection, sympathy, understanding, and a place for experimentation. It is always possible for parent to talk with school counselors and professionals to help with the problem Allen, Porter, McFarland, Marsh & McElhaney (2005) reported that adolescents who were well-liked by many peers displayed high level of ego development and secure attachment, as well as better interactions with their best friends. It was found that associating with students who have a positive affect toward enhanced students own satisfaction with school whereas associating with friends who have a negative affect toward school decreased it (Korir & Kipkemboi, 2014). It is likely that students who experienced difficulty making themselves acceptable in a peer group may also develop challenges in terms of academic in school. While the differences are more observed between adolescents that are neglected and those who are rejected. Experiencing peer rejection can produce heightened anxiety (e.g. worry over being teased or left out) which interferes with concentration in the classroom and impedes children's acquisition and retention of information (DeRosier & Lloyd, 2011).

The teacher should better understand the dynamics that increases student motivation and focus their attention on understanding courses and gain their implication in the proceedings of the sitting (Wentzel, Battle, Russell & Looney, 2010). Students are aware of the importance of working independently, and are able to discover the implicit rule and tacit didactic contracts increase their chance of success (Osma, Kemala & Radid, 2015). They must be motivated and have a real interest in their studies; their skills acquired posteriorly must be adapted to their choice. One of the important factors in teaching Chemistry is student motivation (Hulsizer & Woolf, 2009). Daniels (2010) explained that students' motivation is an important criterion in learning. When students have confidence and are motivated, a high

level of participation is sustained and thus a better understanding of the material is gained (Fisher & Baird, 2005).

Thurston & Topping (2007) reasoned that peer learning as a technique is widely used to promote attainment in students. Students are motivated to review, learn, and comprehend the material when they are put into a teaching role (Cavallaro & Tan, 2006). This situation regulates students in the working process, supporting each other, and thus ensuring that their learning goals are fulfilled (Liaw, Chen, & Huang, 2008). Sinclair (2005) argues that peer learning allows students to actively convey ideas from their peer influence. Students' peer relationships can have an important role in their school adjustment and motivation. Some scholars acknowledged that children's experience with peers constitute an important developmental context for children and adolescents (Ryan, 2000). Liaw et al. (2008) stated that students have more opportunities to be in full control of their own learning and participation without limitation of knowledge levels.

The adolescent peer environment is a multilevel, multifaceted environment that includes three main types of peer interactions: dyads (individual relationships), cliques (small groups of peers who regularly interact with each other), and crowds (adolescents who share the same reputation, but who may not necessarily interact with each other (Rubin, Bukowski & Parker, 2006). As noted earlier, extensive research has been done on how school-average achievement (crowds) affects student-level academic self-concept but less is known if the same relationship exists between peer groups (cliques) and academic self-concept.

The findings showed that peers effects in education ranging from close to zero to about 0.50 standard deviations. In studies where it was possible to identify classmates are possibly are missing out on information on the real reference group of a student. The critical point in measuring the influence of peers is to identify the real peers. Keeping in mind that students spend a relatively big part of their time in class and it seems to be a credible assumption that their classmates are a good proxy of their group peers. However, in some cases there can be significant variation between classes within school- grades and hence the assumption that school grade peers are a good proxy of classmates can be quite strong (Dewan, Ray & Chaudhuri, 2017).

An increasing number of individuals seek a high level of education to secure their future and improve their economic possibilities (Carnevale, Rose & Cheah, 2011). Significant progress has been made in recent years as researchers have made clever use of available data. In particular, a handful of recent papers appears to show broad agreement that disruptive peer behavior has negative effects on individual grade level and achievement (Carrell and Hoekstra 2010; Neidell & Waldfogel, 2010). Consensus is still lacking, however, on achievement spillovers from peer ability, because many recurrent policy issues (charter schools, economic and racial desegregation, tracking/de-tracking) entail redistribution of students on the basis of ability measures or characteristics that correlate with ability, the value of reliable measures of ability spillovers remains high (Burke & Sass, 2011).

A peer group affects student achievement in several ways: members of a group interact in learning, help each other in their studies, share important information, impose externalities on others by behaving well or badly (for example, a noisy student disrupts the study environment) or by allowing teachers to go deeper in subjects, contribute to the formation of values and aspirations, and so on (Misanya, 2013). Misanya (2013) stated that understanding the nature and the magnitude of peer group effects in education is crucial for the "productivity" of educational processes and the organizational design of school systems. For example, in order to improve student outcomes, it is important to know which inputs influence their performance most and the relative importance of peer effects compared to other inputs, such as teacher quality or school resources.

Peer effects are also important in school design. If peer effects are at work, educational outcomes are affected by how students are arranged across classes and the

desirability of comprehensive schools (which mix students of different abilities together) or stratified schools (which tend to aggregate students according to their abilities) depends on the magnitude and non-linearity of peer effects (Paola & Scoppa, 2010). Furthermore, the selectivity of university admission policies produces different results in the presence of peer effects. More importantly, the nature of peer effects also has fundamental implications in a family's choice with regards whether parents consider that their offspring would benefit from schools which sort students according to their abilities (Misanya, 2013). Some of these studies show that peer effects are statistically and economically significant in a variety of educational contexts and those students tend to perform better if the quality of their peer group is higher (Ding & Lehrer, 2007).

Moreover, a number of these studies show that peer effects are often non-linear, implying that students of middle abilities are particularly affected by the negative influence of weak students (Zimmerman, 2003). However, the significance and size of peer effects often changes in relation to the sample used. Other studies, in fact, find no significant (or minor) peer effects (Foster, 2006). Classmates with high abilities help create a more effective learning process: instructors are not interrupted by students asking silly questions and are able to use more challenging material, in addition they are encouraged in their teaching activity by interested and clever students etc. (Lazear, 2001). Research has established a significant link between children's relations with peers and their academic performance. Students who are poorly accepted by their classmates tend to have lower grades, lower scores on achievement tests, lower graduation rates and a higher risk of dropping out. Having friends at school appears to support involvement and engagement in school-related activities and school performance (Buhs, Ladd, & Herald, 2006).

The need for relatedness is the need of having feeling of being securely connected to the social environment and the need to have the feeling of oneself as worthy and capable of love and respect (Kathleen, 2012). It is assumed that the influence of interpersonal relations with classmates on academic progress is mediated by students' relatedness and, subsequently, engagement.

Methodology

This study adopted survey design of the descriptive type of research. This research work was carried out in Ikere Local Government Area of Ekiti State, Nigeria.

The population of the study comprises of all secondary school chemistry students in public secondary schools in Ikere Local Government Area of Ekiti State, Nigeria.

A sample size of two hundred and ten (210) respondents were used for the study. There are ten (10) public secondary schools in Ikere local government area of Ekiti State. six (6) schools were selected for the study using simple random sampling technique. Thirty five (35) respondents were selected from each of the six (6) schools by using simple random sampling techniques. The selection cut across all the senior secondary class 2.

The researchers designed a structured questionnaire which was the only instrument used for the study. The instrument (questionnaire) was divided into two sections, A and B. Section A was used to elicit information on the demographic data of the respondents which include; school, gender, age, and class while section B was used to elicit information on the research variables with a Agree (A) and Disagree (D).

The instrument was subjected to the validity and reliability mechanism. The reliability coefficient index (r) of 0.92 at 0.05 level of significance was obtained.

The questionnaire was administered to students with the help of two (2) trained research assistants and the completed questionnaire was collected on the spot.

The Chi-square (χ^2) statistical analysis was used to test the hypotheses at 0.05 alpha level of significance.

Results and Discussion

Hypothesis 1: There is no significant influence of peer group on students’ motivation towards chemistry in secondary schools.

Table 1: Chi-square test of students’ response

Response	Peer Group & Students’ Motivation towards Chemistry	Cal χ^2	Tab χ^2	Remark
Agree (A)	153	18.53	3.84	significant
Disagree (D)	57			
Total	210			

The result of the analysis in table 1 above shows the difference in the responses of students on the influence of peer group on students’ motivation towards Chemistry. The chi-square test revealed that calculated $\chi^2(18.53)$ was greater than the critical χ^2 value (3.84) at the 0.05 level of significance. This means that there is significant influence of peer group on students’ motivation in secondary schools in Ikere local government of Ekiti State. Hence, the null hypothesis was rejected.

Hypothesis 2: There is no significant influence of peer group on students’ grade level in senior secondary schools.

Table 2: Chi-square test of students’ response

Response	Peer Group & academic performance	Cal χ^2	Tab χ^2	Remark
Agree	138	12.78	3.84	significant
Disagree	72			
Total	210			

The result of the analysis in Table 2 above shows the difference in the responses of students on the influence of peer group on students’ grade level. The chi-square test revealed that calculated $\chi^2(12.78)$ was greater than the critical χ^2 value (3.84) at the 0.05 level of significance. This means that there is significant influence of peer group on academic performance of chemistry students in secondary schools in Ikere local government of Ekiti State. Hence, the null hypothesis was rejected.

Discussion of results

The findings of the study revealed that for test of hypothesis 1 there was significant influence of peer group on students’ motivation towards Chemistry in secondary schools. The peer group is a source of affection, sympathy, understanding, and a place for experimentation. The finding of this study is in line with Korir & Kipkemboi (2014) assertion that it was found that associating with students who have a positive peer group relationship affect toward enhanced students own satisfaction with school whereas associating with friends who have a negative affect toward school decreased it. It is likely that students who experienced difficulty making themselves acceptable in a peer group may also develop challenges in terms of academic in school.

Students' peer relationships can have an important role in their school adjustment and motivation. Also, the finding of the study corroborated with the Sinclair (2005) argument that peer learning allows students to actively convey ideas from their peer influence. While the differences are more observed between students that are neglected and those who are rejected. Experiencing peer rejection can produce heightened anxiety which interferes with concentration in the classroom and impedes chemistry students in secondary schools learning, retention and transfer of knowledge in the application of chemistry theories and principles.

The findings of the study revealed that for test of hypothesis 2 there was significant influence of peer group on academic performance of chemistry students in secondary schools in Ikere local government, Ekiti State, Nigeria. A peer group affects student academic performance in several ways: members of a group interact in learning, help each other in their studies, share important information, and impose externalities on others by behaving well or badly.

Keeping in mind that students spend more of their time in class and it seems to be a credible assumption that their classmates are a good proxy of their group peers. The finding of the study agreed with Ding & Lehrer (2007) findings that peer effects are statistically and economically significant in a variety of educational contexts and that students tend to perform better if the quality of their peer group is higher. The critical point in measuring the influence of peers is to identify the real peers. Dewan, Ray & Chaudhuri (2017) stated that in some cases there can be significant variation between classes within school- grades and hence the assumption that school grade peers are a good proxy of classmates can be quite strong. As noted earlier, extensive research has been done on how school-average achievement (crowds) affects student-level academic self-concept but less is known if the same relationship exists between peer groups (cliques) and academic self-concept. Classmates with high abilities help create a more effective learning process. Peer effects are also important in school design. If peer effects are at work, educational outcomes are affected by how students are arranged across classes and the desirability of comprehensive schools

Conclusions

Based on the findings derived from the analysis of data in this study, the following conclusions were made: peer group influenced students' motivation towards Chemistry in secondary schools. Peer group influenced grade level of senior secondary school Chemistry students. Peer group influenced learning styles of senior secondary school Chemistry students. Peer group influenced academic aspiration of senior secondary school Chemistry students.

Recommendations

Based on the findings, the following recommendations were made:

1. Peer group learning should be introduced often in the teaching and learning of chemistry so as to allow students' academic development through peer interaction that will promote high level of motivation among Chemistry students towards the subject.
2. Chemistry teachers should try and identify the learning differences of Chemistry students in secondary schools so as allow the slow learners learn directly and freely from their peers without any intimidation and this could help in improving their grade level in Chemistry examinations.
3. Teachers should provide the opportunity and medium for students' interaction in the Chemistry class so as to allow the students to develop attitude to learning as this will help them to understand which learning styles suit their learning behaviour within and outside the classroom as they relate with their peers.

References

- Abdullahi, S. & Bichi, A. A. (2015). Gender issue in students' academic achievement in English Language, *Kano Journal of Educational Studies* 4(2), 31-38.
- Adediwura, A. A. & Tayo, T. (2007). Perceptions of Teacher Knowledge, Attitude and Teaching Skills as Predictor of Academic Performance in Nigerian Secondary Schools, *Educational Research and Review*, 2(7), 165-171.
- Adeyemo, D. A. & Torubelu, A. (2008). Self-Efficacy, Self- Concept and Peer Influence as Correlates of Academic Achievement Among Secondary School Students in Transcution, *Pakistan, Journal of Social Sciences*, 5(1), 10 – 16 <http://medicine//journals.com>.
- Adika, L. O. & Toyobo, O. M. (2007). Relationship between Peer Influence, Pupils Interest in Schooling and Academic Achievement, *The Social Sciences*, 2, 436 – 441 <http://medwelljournals.com>.
- Ajibade, B. O. (2016). Influence of Peer Group Relationship on the Academic Performance of Students in Secondary Schools (A Case Study of Selected Secondary Schools in Atiba Local Government Area of Oyo State), *Global Journal of Human-Social Science*, 16(4), 35-47.
- Allen, J. P., Porter, M. R., McFarland, F. C., Marsh, P., & McElhaney, K. B. (2005). The two faces of adolescents' success with peers: Adolescent popularity, social adaptation, and deviant behavior, *Child Development*, 76(3), 747-760.
- Anselmus, S. (2011). *Teachers' competence and student achievement*, Timor University Press.
- Asikhia, O. A. (2010). Students' and teachers' perception of the causes of poor academic performance in Ogun State secondary schools: Implication for counselling for national development. *European Journal of Social Sciences*. 13(2): 229—242.
- Boit, M., Njoki, A. & Chang'ach, J. K. (2012). The Influence of Examinations on the Stated Curriculum Goals, *American International Journal of Contemporary Research*, 2(2), 179 –182.
- Buhs, E. S., Ladd, G. W. & Herald, S. L. (2006). Peer exclusion and Victimization: Processes that mediate the relation between peer group rejection and children's classroom engagement and achievement, *Journal of Educational Psychology*, 98, 1–13.
- Burke, M. A. & Sass, T. (2011). *Classroom Peer Effects and Student Achievement*, National Center for Analysis of Longitudinal Data in Education Research, Working Paper 18.
- Burmeister, M., Rauch, F. & Eilks, I. (2012). Education for sustainable development (ESD) and chemistry education, *ChemEducResearc and Practice* 13(2), 59-68.
- Carnevale, A. P., Rose, S. J. & Cheah, B. (2011). *The College Payoff: Education, Occupations, Lifetime Earnings*, Georgetown University Center on Education and the Workforce.
- Carrell, S. E. & Hoekstra, M. L. (2010). Externalities in the classroom: How children exposed to domestic violence affect everyone's kids, *American Economic Journal: AppliedEconomics*, 2(1), 211–228.
- Cavallaro, F. & Tan, K. (2006). Computer-mediated peer-to-peer mentoring. *AACE Journal*, 14(2), 129–138. Chesapeake, VA: AACE.
- Daniels, B. M. (2010). *Motivation, academic success, and learning environments: Comparing high school face-to-face and online courses* (Doctoral Dissertation). Retrieved January 22, 2010 from <http://ezproxy.um.edu.my:2110/pqdweb?did=1674096401&sid=1&Fmt=2&clientId=18803&RQT=309&VName=PQ>.
- DeRosier, M. E. & Lloyd, S. W. (2011). The Impact of Children's Social Adjustment on Academic Outcomes, *Read Writ Quarterly*, 27(1), 25–47.

- Dewan, P., Ray, T. & Chaudhuri, A. R. (2017). *Gender Peer Effects in High Schools: Evidence from, India*, Indian Statistical Institute, Delhi Center, <https://www.isid.ac.in/~epu/acegd2017/papers/ArkaRoyChaudhuri>.
- Dinah, W. J. (2012). *Performance in Kenya Certificate of Secondary Education in Public Secondary Schools in Imenti South District Kenya*, Research Project Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Education in Educational Administration, 35-37.
- Ding, W. & Lehrer, S. F. (2007). Do peers affect student achievement in China's secondary schools? *Review of Economics and Statistics*, 89, 300–312.
- Eke, G. E. (2008). Regulatory Mechanism for Sound Chemicals Management. *A paper presented at the 1st mandatory training workshop of ICCON in Lagos, Nigeria*.
- Ekeke, J. T. (2013). *International Journal of Networks and Systems*, 2 (3), 15-20.
- Ekici, G. (2010). Adaptation of the biology motivation questionnaire to Turkish, *Contemporary Education Journal*, 34 (365), 6-15.
- Federal Government of Nigeria, (2013). *National Policy on Education*, NERDC Press, Lagos.
- Fisher, M. & Baird, D. E. B. (2005). Online learning design that fosters student support, self-regulation, and retention. *Campus-Weg Information System*, 22(2), 88–107.
- Foster, G., (2006). It's not your Peers, and It's not your Friends: Some Progress toward Understanding the Educational Peer Effect Mechanism, *Journal of Public Economics*, 1455-1475.
- Hofstein, A., Eilks, I. & Bybee, R. (2011). Societal Issues and their Importance for Contemporary Science Education: A Pedagogical Justification and the State of the Art in Israel, Germany and the USA. *International Journal of Science and Mathematics Education*, Published online first January 4, 2011.
- Hulsizer, M. R., & Woolf, L. M. (2009). *A guide to teaching to statistics: Innovations and best practices*, Retrieved from <http://www.webster.edu/teachstats/chapter4.htm#minute>.
- Ide, K., Parkerson, J., Haerted, G. O. & Walberg, H. J. (2006). Peer group influence on educational outcomes, *A Quant. Synth. Edu. Psychology*, 73, 472-484.
- Kang, C. (2006). Classroom Peer Effects and Academic Achievement: Quasi-Randomization Evidence from South Korea, *Journal of Urban economics forthcoming*, 45-55.
- Kathleen, H. (2012). *Impact of Student Engagement on Achievement and Well-Being*, A Literature Review Prepared for the Ottawa-Carleton District School Board, 21.
- Korir, D. K. & Kipkemboi, F. (2014). The Impact of School Environment and Peer Influences on Students' Academic Performance in Vihiga County, Kenya, *Journal of Education and Practice*, 5(11), 1-12.
- Landau, A. (2017). *Peer group and educational outcome*, <http://inside.bard.edu/academic/specialproj/darling/bullying/group2/alison.html>, (Accessed 10 May, 2017).
- Lazear, E. (2001). Educational Production, *Quarterly Journal of Economics*, 3, 777-803.
- Liaw, S. S., Chen, G. D. & Huang, H. M. (2008). Users' attitudes toward Web-based collaborative learning systems for knowledge management, *Computers & Education*, 50(3), 950–961.
- Marques, J. (2010). *Joy at Work at Joy, Living and Working Mindfully Every Day*, Personhood Press.
- Misanya, S. M. (2013). *Peer influence on Academic Performance of Form One Students in Girls Boarding Secondary Schools in Kanduyi Constituency*: Kenya, Unpublished Master Thesis, University of Nairobi.
- Neidell, M. & Waldfogel, J. (2010). Cognitive and non-cognitive peer effects in early education, *Review of Economics and Statistics*, 93(2), 562–576.

- Oloyede, D. O. & Olatoye, R. A. (2013). Peer Influence on the Study Habit of Secondary School Adolescents in Ogun State, *Nigeria, African Journals Online (AJOL)* <http://www.apl.info/index.php/ifep/artilce/view23678> Retrived 10th April, 2013.
- Osma, I., Kemala, F. E. & Radid, M. (2015). Analysis of Determinants and Factors Motivating Students in Higher Education: Case of the Students of Chemistry at the Ben M'sik Faculty of Sciences, *Procedia - Social and Behavioral Sciences*, 197, 286-291.
- Otokiti, O. C. (2016). Influence of School Environment on Students' Academic Performance among Secondary Schools in Ikere Local Government Area of Ekiti State, An unpublished project submitted to the department of physical and health education, faculty of education, UNN, Ikere campus.
- Paola, M. & Scoppa, V. (2010). *Peer Group Effects on the Academic Performance of Italian Students*, Department of Economics and Statistics, University of Calabria (Italy), Online at <http://mpira.ub.uni-muenchen.de/18428>.
- Rubin, K. H., Bukowski, W. & Parker, J. G. (2006). *Peer interactions, relationships, and groups*, In W. Damon & R. Lerner (Series Eds.) & N. Eisenberg (Volume Ed.), *Handbook of child psychology*, 6th edition: 3, Social, emotional, and personality development, 571–645, New York, NY: John Wiley & Sons.
- Ryan, A. M. (2000). Peer groups as a context for the socialization of adolescents' motivation, engagement, and achievement in school, *Educational Psychologist*, 35(2), 101-111.
- Sajjad H., Riasat, A., Amir, Z., Abdul, G., Syed, M. & Maksal, M. (2013). The Impact of Peer Groups on the Academic Achievements of Secondary School Students, *Journal of American Science*, 9(11), 13-16.
- Salleh, M. J. (2011). *Peer Influence in Academic Achievement and Behaviour among Students of Mara Science College*, Malaysia. National Seminar on Counselling Across Culture. Pekema. <http://rop.iicim.edu>
- Sinclair, M. P. (2005). Peer interactions in a computer lab: Reflections on results of a case study involving web-based dynamic geometry sketches, *Journal of Mathematical Behavior*, 24, 89–107.
- Thompson, T. L. & Mintzes, J. J. (2002). Cognitive structure and the affective domain: On knowing and feeling in Biology, *International Journal of Science Education*, 24(6), 645–660.
- Thurston, A. & Topping, K. J. (2007). Peer tutoring in schools: Cognitive models and organisational typography, *Journal of Cognitive Education and Psychology*, 6(3), 356–372.
- Umoinyang, I. E. & Okpala, P. (2001). Socio-psychological factors, knowledge and understanding of mathematics achievement at cognitive level of thinking. *Evaluation Research*, 1(1), 55-62.
- Wentzel, K. R., Battle, A., Russell, S. L. & Looney, L. B. (2010). Social supports from teachers and peers as predictors of academic and social motivation. *Contemporary Educational Psychology*, 35(3), 193–202.
- Yilmaz, H. & Cavaz, H. P. (2007). Reliability and Validity Study of the Students' Motivation toward Science Learning (SMTSL) Questionnaire. *Elementary Education Online*, 6 (33), 430-440.
- Zimmerman, D. (2003). Peer effects in academic outcomes: Evidence from a natural experiment. *Review of Economics and Statistics*, 85(1), 9–23.