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Parental Education, Peer and Gender Effects on Academic Achievement of Secondary School Students in Botswana

[1]Tella, Adeyinka, [2]Adu, Olusola, Emmanuel, [2]Tella, AdedejI and [3]F.A. Toyobo
[1]Department of Library Information Studies, Faculty of Humanities,
University of Botswana, Botswana
[2]Department of Teacher Education, Faculty oF Education, University of Ibadan, Nigeria
[3]Tai-Solarin University of Education, Ijebu-Ode, Nigeria

Abstract: The study examined parental education, peer and gender effects on academic achievement of Senior Secondary School Students in Gaborone, Botswana. The study drawn 500 Students selected through stratified random sample of ten senior secondary schools. Students bio-data questionnaire with (r = 0.68) and a modified Peer Effect Rating Scale with (r = 0.72) cronbach alpha, adapted by the researcher from National Assessment Educational Progress Scale were used to gathered data on the study. Two research questions were tested using Descriptive statistics, Multiple Regression and Student-t. The results indicates parental education, peer and gender have joint effect and contribute significantly to academic achievement of the participants. Findings reveals further that gender difference exists in the academic achievement of the secondary school students. Based on these findings, it was recommended that parents should use their education experience to give all the needed support to enhance academic achievement of their children. And that the issue of gender bias associated with our educational system should be removed without further delay.

Key words: Parental education, peer effects, gender, academic achievement, Botswana

INTRODUCTION

Research seems to identify a considerable number of factors influences or affects academic achievement of students especially at the secondary school levels. The literature identifies many factors that might bring variance in academic achievement including individual attributes as well as those of the school and society. Variables associated with each of these factors influence the academic achievement of students. Most academics recognize that a child's peer can have an impact on his achievement, but the extent of that effect has been an open question[1]. So also parental education and social economic status seems to have an impact on student achievement only the exact nature is not clear[2]. The literature on gender effects and academic achievement is extensive and some findings seems to reveals that females usually score higher on average than males on test of verbal abilities[3] and that males score higher on average than females on tests of mathematical abilities[3] spatial abilities[4] and on tests of stereotypically male vocational information and aptitude[4].

Parental educational background and qualifications have as well been reported in some studies as influencing students achievement so also is the issue of peers influence. It was reveal from literature according to Hanushek[5] that there have been relatively few direct investigations on the impact of peer groups on student performance and what evidence exists has been open to widely varying interpretations. As it is noted gender issue is now one of the important central focus of globalisation and researchers have even reveal its effect on academic achievement All these have been confirmed in studies across western culture. The need to examine whether the same result will be obtained in an African setting is highly germane. Therefore, the present study is conceived to examine the relationship among parental education, peer and gender effects with academic achievement in a population of secondary school students in Botswana where it is assumed that study of this kind is very rare.

Literature review

Parental education: Many researchers have noted that the educational attainment of a child's parents is good predictor of the academic achievement of the child[1].This author explained that parents who are, for instance college educated could be better equipped to help children with their homework and the understanding of concepts than

Corresponding Author: Tella, Adeyinka, Department of Library Information Studies, Faculty of Humanities, University of Botswana, Botswana

those with less than a secondary school education. Why, because, the education level of one parent is often highly correlated with that of the other, only a single variable is included. In analyzing the[6] National Assessment of Education Progress (NAEP) data on reading, the report concludes that family background factors such as household environment and parental education play an important role in explaining achievement of students. A parent's education level did appear to affect the performance of children in traditional school settings[7]. Students taught at home by mothers who never finished high school scored a full 55 percentile points higher than public school students from families of comparable educational background

Available and accessible research evidence has indicated that parental education and family structures alone are not good predictors of student's academic achievement[8]. While[9] reported a contrary finding to that of Philips that parental education accounted for about 24% of the variance in students tests score. In his own study[10] reported that parental education has positive effects on education, though stronger in the case of mother. Chang[11] revealed that parental factors generally did not contribute much explanatory power and that school attitudes may mediate the relationship between peer delinquency and academic achievement. Interventions aimed at promoting positive adjustment and school outcomes should focus on the role of delinquent peer affiliations and youth's attitudes toward school. Cherian[12] investigated the relationship between parental education and academic achievement of 1021 Xhosa pupils (369 boys and 652 girls) whose ages ranged from 13 to 17 years (M age, 15.6 yr.). The sample included 712 children for whom both parents were alive and 308 children for whom either or both parents were deceased. Children were chosen at random from the Standard 7/Year 9 population of Transkei, South Africa. A simple questionnaire was administered students to identify whether one or both parents were dead or both parents were living.

Zohreh[13] addresses the mediating role of home enrichment in early childhood in the association of parental education and children's academic achievement. Regression analyses indicate that the influence of parental education on children's academic achievement decreases significantly when the mediation role of home enrichment is accounted for. More specifically, children's academic achievement in grade one relies to a larger extent on home enrichment factors in early childhood than on parental education. Davis-Kean[14] in his study examined the process of how socioeconomic status, specifically parents' education and income, indirectly relates to children's academic achievement through parents' beliefs and behaviors. Data from a national, cross-sectional study of children were used for this study. The subjects were 868 8-12-year-olds, divided approximately equally across gender (436 females, 433 males). This sample was 49% non-Hispanic European American and 47% African American. Using structural equation modeling techniques, the author found that the socioeconomic factors were related indirectly to children's academic achievement through parents' beliefs and behaviors but that the process of these relations was different by racial group. Parents' years of schooling also was found to be an important socioeconomic factor to take into consideration in both policy and research when looking at school-age children.

Also in a study that examined the factors influencing the academic performance of all students on the LFL program, it was found that parents education level significantly influenced student academic performance[15,16]. The study also reveals that students who had a parent(s) with university qualifications achieved higher levels of academic performance than students who did not have a parent(s) with university qualification. Furthermore, the authors of this study posited that parents with higher educational attainment may have been more likely to promote the value of higher levels of achievement and to provide both the psychological and educational support students needed to excel in school[15]. Similarly, in another study by Zapala[17] in which the factors associated with home computer, internet access and usage among a large sample of LFL students was examined, the level of parental education was prominent, with home access and usage of computers and internet among students increasing as the level of parental education increased. Previous research work has made evident the positive impact of parental education on academic achievement. The main focus of the present study therefore was to find out if parental education together with peer and gender effects could lead to academic achievement of secondary school students.

Peer effect: Attention to peer effects has taken place largely in the absence of compelling empirical evidence on the impact of peer group characteristics on a variety of academic, social, and labour market outcomes[18]. Manski[19] and Moffit[20] point out that the empirical analysis of peer influences has been inhibited by both conceptual and data problems problems that raise serious questions about interpretation of the existing studies, even those that use sophisticated economic techniques including instrumental variables. Most peers act as important role models, who are seen as powerful means of transmitting attitudes, values, norms and patterns of thought and behaviour[21]. The 1998 NAEP asked the most interesting question to gauge the effect of peers on academic achievement. The survey asked the students to strongly agree, agree, disagree, or strongly disagree with

the following statement ''my friends make fun of people who try to do well in school''. This question is particularly useful in measuring the effects of peers on academic achievement[1]. A critical point in measuring the influence of peers is the fact that there is no information about the 'real' reference group of a student[22]. Since it is possible to identify the friends of the student in question, there is need to assume that students are significantly influenced by their classmates, keeping in mind that students spend a relatively big part of their time at school. This was why[23,24] indicated that classmates are important in determining high school teen behaviour particularly those related to school achievement.

Attempt to estimate peer effects on educational achievement directly have been relatively limited[5]. Hanushek *et al.*[25,18] finds no peer achievement effects, while Zimmer and Toma[26] report positive influences of higher achieving peers at least for some students. Hanushek *et al.*[5] explain that in general there has been limited attention giving to the mechanism through which peers affect outcomes. The most common perspective according to them is that peers, like families, are sources of motivation, aspirations and direct interactions in learning. la Lazear in Hanushek *et al.*[5] asserts that peers may affect the classroom process-aiding through questions and answers, contributing to the pace of instruction, or hindering learning through distructive behaviour. Betts and Zau[27] and Vigdor and Nechyba[28] showed that the analysis of peer effects at class level yield stronger effects compared to the grade level. Additionally, several empirical studies have been carried out to measure peer effects in secondary schools[29-31]. Most of the studies found sizeable positive effects of school or classmates on students' achievement, whereas these effects were found to be somewhat stronger at class level. Empirical analysis of peer effects on student achievement has been open to question because of the difficulties of separating peer effects from other confounding influences. While most econometric attention has been directed at issues of simultaneous determination of peer interactions, Hanushek *et al.*[5] argue that issues of omitted and mismeasured variables are likely to be more important. These researcher control for the most important determinants of achievement that might confound peer estimates by removing student and school-by-grade fixed effects in addition to observable family and school characteristics. Their analysis also addresses the reciprocal nature of peer interactions and the interpretation of estimates based upon models using past achievement as the measure of peer group quality. The results indicate that peer achievement has a positive effect on achievement growth. Moreover, students throughout the school test score distribution appear to benefit from higher achieving schoolmates. On the other hand, the variance in achievement appears to have no systematic effect. In the present study, the emphasis is to ascertain the effects students peer could have on their academic achievement.

Gender effect: Research has suggested on an empirical level that, girls perform on reading and writing subjects while boys perform better on the more analytical subjects of math and science[32,33]. Many authors that have expounded on the male-female achievement gap are often inconsistent. In 1998 for example, young men scored higher on both the verbal and quantitative sections of the Scholastic Achievement Test (SAT) than young women[1]. In the same vein, researchers have noted that this may be because of a bias against female in our educational system[34]. Kirk[1] gave a further explanation that the tests results reflect a selection bias in which more at risk females opt to take the scholastic achievement test relative to males. Traditionally, gender and race have been consistent predictors of student performance. But home schooling is breaking down those barriers[7]. Math and reading scores for minority home school students show no significant difference when compared to white's. A similar comparison for public schools students, however, demonstrates a substancial disparity[7]. When segmented by gender, test scores for home schoolers reveal that boys are slightly better in math and girls are somewhat better in reading. Public school student performance in math follows asimilar pattern, but public school boys' reading scores are markedly behind girls.

Women and men are known to differ in their college experiences and face different outcomes. It was suggested in a study that female students almost likely to cheat as their male counterparts even though the former's ethical standards tend to be higher than those of the later[35]. Results from another study indicate that men are more likely to be either disengaged or highly engaged in constructive educational activities while women are more likely to fall in between these extremes into a more typical group[36]. Gender as well seems to influence what type of student groups one affliates with. Women are more likely to be labelled as a grind whereas men are much more likely to be labelled as recreator[37]. Grinds exhibit a high level of academic effort and recreators are involved with sports and exercise. Rau and Duran[38] and Smith and Pino[39] put forward that students who are labelled as grinds exhibited attitudes and behaviours very similar to those who have been identified as possessing an academic ethic. Furthermore, Kyong[35] investigated

gender differences in the academic ethic and academic achievement among college students using a survey data collected from students at a medium size state University in the South East. Results of the analysis indicate that women are more likely to possess an academic ethic than men and that women tend to have higher GPAs. It was further reveals that regression analysis with GPA as the dependent variable revealed differences between men and women in terms of significant predictors. For women, active participation in student clubs or groups was positively associated with GPA For men employment was negatively related with GPA.

Available literature seems to point to the fact that gender do influence and affect academic achievement. The question now is; will this gender effect make a difference as well in the academic achievement of population of junior secondary school students in Botswana? It is now glaring from the available literature that academic achievement is now considered to be so important and of concern to many educational stakeholders: Essentially therefore, one of the purpose of this study is to examine whether gender will exert any influence on secondary school students achievement?

To achieve the above stated objectives the following research questions were developed to guide the study. These are:

- What is the joint effect of Parental education, Peer and Gender effects (independent Variables) on the academic achievement of the participants?
- What is the relative effect of each of Parental Education, Peer and Gender on the academic achievement of the participants?

MATERIALS AND METHODS

Research design: The study adopted an ex-post-facto research approach. It is an after the fact study. This approach does not involve the manipulation of variables. It neither adds to nor subtracts from the existing facts. It only carefully observes and records information as it naturally occurred at the time the study was conducted.

Participants: Ten secondary schools selected through stratified random techniques in Gaborone, Botswana were used in the study. In each of the randomly selected schools, participants were selected through a simple random technique. On the whole, five hundred students (500) comprising 200 boys and 300 girls participated in the study (the female participants outnumbered the male participant because the population of Botswana in term of sex is ratio 3:1, Female 3: Male 1).All subjects were selected in junior secondary classes. Their age ranged between 11-15 years with a mean age of 12.5 years.

Instrumentation

Students bio-data questionnaire: Students Bio-data Questionnaire with r = 0.68 through a cronbach alpha was developed to gathered data on the gender and parental level of education of the participants. Participants were required to indicate on the instrument their gender in term of male or female, their class and age. They were also required to tick the educational qualification of their parents from the options provided. These range from:

- Primary school leaving certificate;
- Secondary school certificate;
- Technical certificate;
- Teachers Diploma certificate;
- Bed, Med, BA, MA, BSc, MSc;
- PhD

These parental educational qualifications were grouped into two where parents with qualification 1-3 constitute a group and parent with qualification 4 -6 constitute the second group. With these grouping t-test statistics was applied to find out whether students from either group perform better than the other. And to ascertain the particular group that perform better, a post-hoc analysis will be applied.

Peer effects rating scale: A modified ten items peer effect rating questionnaire was used to gathered data on peer effect and academic achievement of the participants. This was administered alongside students Bio-data Questionnaire. It is a likert type format questionnaire with responses ranging between strongly agrees to strongly disagree. Some of the items of the questionnaire include as follow:

- My friends make fun of people who try to do well in school.
- My friends do not make fun of me.

All the items in the questionnaire were adapted from NAEP[6]. The reliability Coefficient of the Scale for the population of this study was found to be r = 0.72 through a cronbach alpha.

Still as part of the instrument, data on academic achievement were collected from the schools records of the students' scores in English Language, Mathematics and Social Studies of the term preceding the administration of the questionnaires.

Procedure: Permission was obtained from the authority of the sampled schools after which the researchers with three other research assistants administered the instruments to the participants. Informed consent of the participants was also sought before the administration of the instrument. All participants were administered the two questionnaires in their various schools. Instructions on how to respond to each item in the questionnaires were read to ensure understanding and proper filling of the instrument. Out of the 600 questionnaires administered, only 500 were valid and considered for the analysis on this study.

Data analysis: Relationship between the independent variables (Parental Education, Peer and Gender Effects) and dependent variable (Academic Achievement) was ascertained using the corresponding scores obtained from the variable and tested the same through pearson product moment correlation coefficient statistics. Similarly, data on the Joint effects of variables were analysed using Multiple Regression and t-test statistics

RESULTS

Table 1 contains descriptive statistics and Intercorrelations among the study variables. As indicated in Table 1, academic achievement correlated with: (1) Parental Education ($r = .4126$; $p<0.05$); Peer Effect ($r = .3902$; $p<0.05$) and Gender ($r = .2677$; $p<0.05$). There were also significant correlations among the three independent variables.

The first research question sought to find the joint effect of parental education, peer and gender effects (independent variables) on academic achievement (dependent variable of the participants. The result is presented in (Table 2).

The Table 2 shows that the independent variables (Parental Education, Peer and Gender) when pulled together have significant effect on the academic achievement of the participants. The values of R (adjusted) = 0.492 and R2 (adjusted) = 0.3214. The analysis of variance performed on multiple regressions yielded an F-ratio Value of 15.0106 and was found to be significant at 0.05 levels.

The Table 3 shows that each of the independent variables made a significant contribution to academic achievement. In term of the extent and the degree of contribution, parental education made the most significant contribution (Beta = .283; t = 4.27; $p<.05$) to the determinant of academic achievement. Other variables as well made significant contributions in the following order: Peer Effect (Beta = .208; t = 3.70; $p<.05$) and Gender (Beta = .156; t = 3.64;$p<.05$).

Furthermore, the study try to find whether there is gender difference in the academic achievement of the participants. The table below present the results.

The Table 4 reveals that there is significant gender difference in the academic achievement of the participants with t.obs = 6.1; t.crit = 1.96; P.05. Since gender difference have been revealed in Table 4, it is interesting to find out which gender performed better than the other. To do this, a post hoc análysis was conducted. The result is presented in (Table 4b).

The result in Table 4b shows that the post-hoc análysis reveals male to perform better than the female on this study. This confirm the result in Table 4a that there is gender difference in the academia performance of the participants.

The result in table one reveals that parental education correlate with student's academic achievement. If this is so, there is need to find the difference in the performance of student from parents with high educational qualifications and those from parent with lower educational qualification. The grouping was done in the methodology. The result is presented in (Table 5).

The result in Table 5 show that significant difference exist in the academic achievement of students from parents with higher educational qualifications and tose from parents with lower educational qualifications. A post hoc análysis was also performed on this results to ascertain whether it is the student from parents with higher educational qualification that performed better than the other or otherwise. This information is presented in the Table 6:

Table 6 confirms that it is students from the parents of high educational qualifications that perform better than the students from the parents with lower educational qualification. This confirms what obtain in the literatura that parental educational level seems to influence students academic achievement.

Table 1: Descriptive statistics and intercorrelaton among the variables

Variables	N	Mean	SD	Academic achievement	Parental education	Peer effect	Gender
Academic achievement	500	72.4128	25.8122	1.0000			
Parental education	500	42.2025	11.7114	-.4216**	1.0000		
Peer effect	500	33.6517	9.5666	0.3902**	0.5344**	1.0000	
Gender	500	30.3511	9.1012	0.3111**	0.2677**	.2543**	1.0000

N = 500, correlation greater than .25 are significant at $p<.05$, **$p<.001$

Table 2: Multiple regression analysis on academic achievement data

	Analysis of variance				
	Sums of squares	df	Mean Square	F	P
Regression	5614.221	3	1871.407		
Residual	61837.346	496	124.6720	15.0106	0.05
Total	6451.567	499			

Multiple R (adjusted) = 0.492, Multiple R Square (adjusted) = 0.3214, Standard Error of the Estimate = 5.27

Table 3: Relative contributions of the independent variables to academic achievement

	Unstandardized Coefficient		Standardized Coefficient		
Model	B	Standardized error	Beta	t.cal	P
Constant	27.233	2.877		7.5	<.05
Parental education	0.376	0 .062	0 .283	4.27	<.05
Peer effect	0.328	0.079	0.156	3.64	<.05
Gender	0.301	0.051	0.208	3.70	<.05

Table 4: Gender difference in academic achievement of the participants

Variables	No.	X	SD	Df	t.obs	t.crit	P	Remark
Male	200	38.6	15.4	498	6.1	1.96	.05	NS
Female	300	47.8	24.8					

Significant

Table 4b: Post hoc análysis of the gender difference

Variables	Aca. Acmnt	Male	Female
Academic achmt	S**	S*	NS
Male	S*	S**	S*
Female	NS	S*	NS

Table 5: Parental education and academic achievement

Parents Edu.	No.	Mean	Sd	df	T.cal	T.tab	P	Remark
Higher educ			14.7					
Qual	225	58.45						
Lower Edu.				498			0.05	
Qual	275	53.9	12.3					

Table 6: A post-hoc analysis of parental education and student achievement

Academic achievement	1	2	3
Students from parent of high Edu.Qual.	S*		
Student from parents of low Edu. Qual.	NS		

DISCUSSION

This study has so far examined the relationship between parental education, peer and gender effects on academic achievement of secondary school students. The various results obtained on the study have also reveals that the three variables: parental education, peer influence and gender associate with academic achievement. All the variable at the same time have the predictive capability of academic achievement only that the magnitude of the prediction varied. Additionally, the results showed that significant difference exist in the gender performance with male students performing better than the female students. Likewise it was revealed that students from parents with higher educational qualifications performs better than those from parents with lower educational background.

The results of the first research question on the study revealed that all the independent variables have a joint effect on the academic achievement of the participants. The degree of the effects of these independent variables was shown in the value of R = 0.492 and R2 (adjusted) = 0.3214. The result thus indicated that 32.1% of the variation of the academic achievement of the participants is accrued to the linear combination of the three variables. The F-ratio value which was found to be (F = 15.0106, p<.05) further buttressed the result. Meanwhile, the findings are in agreement with the previous reports of researchers like[8-10, 27, 28, 30, 31, 1, 33].

The importance of the three independent variables focused on this study on academic achievement cannot be overemphasised. For instance parents who are educated and better achieved academically usually want their children to emulate the gesture. And children of such parents as well usually struggle to be like their parent, while on the contrary parents who never see the fore wall of the school; their children seldom sees something better in being an academic achiever.

The contribution of gender and peer effect to academic achievement of the students on this study is also something to go by. Gender usually leads to healthy rivalry in academic achievement. This is one of the advantages of mixed school over single sex school. While as well the type of peers a student has usually determined how far such student goes in academics. Student who moves with brilliant, business minded and ambitious peers usually do well academically than those who move with the no future ambition, vandals and drug abusers. The gender difference in the academic achievement as revealed by the findings on this study, on the other hand, may be likened to the issue of bias against female in our educational system as earlier pointed out by Myra and Sadker[34] . Gender issue in students' achievement was factored in to examine its interactive effects with peer influence and parental education. As could be observed from the results, it was reported that student gender has effect on achievement. It is however, striking to note here that male rather than females(who are noted for better performance in a verbal related subject) performed better. One major explanation for this is the fact that male students are noted for hardworking and giving whatever it takes to perform when it come to academic. Majority of them have been found not to always contended with scoring lower marks or grades in achievement tests. Hence, their show of better performance.

These findings have some implications. First, parents could have to note that their level of education is very significant and crucial to the academic achievement of their children. Therefore, there is need for them to use their education experience to provide all the necessary support to their children education because it is assumed that this could bring a better academic performance. Effort should be made by them to be positively disposed to the academics of their children. Two, parents and school should be sensitive to the issue of peer groups and gang keeping of the children as this could make or mar academic achievement and even ruins their future. It is therefore recommended that counselling psychologists and schools counsellors should see to it that effective guidance and counselling on the type of peers to keep in school by the students is provided for them from time to time. Additionally, the issue of gender bias in our educational policy and system should be removed.

CONCLUSION

It is important to acknowledge that this study has some limitations. First, although the sample size for this study was relatively big, the fact still remains that it did not represent the totality of students in the secondary schools in Gaborone, Botswana. Two, the sample was predominantly from a city i.e. Gaborone. This place great limitation in ascertaining the generalizability of the findings of the study.

Despite these limitations, the findings of the study have provided a further need on how to improve upon the academics of students. In particular, the study has shown that parental education, peer influence and gender cannot be over emphasized in academic success.

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