

The Influence of Gender and Intellectual Ability on Students Time Utilisation and Academic Achievement

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Abstract

The study investigated the time students in public senior high schools in the Northern Region of Ghana spend on academic related activities and their academic achievements by gender and intellectual ability. Five hundred (500) students from seven public senior high schools in the Northern Region of Ghana participated in the study. A combination of probability and non-probability sampling techniques were employed using a cross sectional survey to get a sample of respondents from whom data was collected through questionnaire. The data was analyzed using One-way ANOVA and multiple regressions with factors that might influence the outcome of the study controlled. The results revealed that low and high intellectual ability students differ significantly with respect to the time they spend on self-study and class attendance. The study finds conclusive evidence that intellectual ability and gender have a significant impact on time utilization rates among students of senior high schools. The results also show significant intra and inter gender differences between males and females with respect to the time they spend on self-study and group study activities. The study recommends that educational authorities should take the time use disparities into consideration when designing curriculum activities so as to take care of these different student groupings.

Introduction

Academic learning time has gained the attention of many writers and researchers in recent times. A review of research literature on the construct revealed that much has not been done to link gender and academic ability to time utilization in public senior high schools in the Northern Region of Ghana. In a questionnaire and achievement test data from 1,584 seventh and ninth grade elementary school children in the United States, Smith (1990) explored the relationship between

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academic achievement and time devoted to various uses related to school, family, peers, and the mass media with relevant demographic factors (i.e. students background characteristics, parental socio-economic background, motivational factors and school environmental conditions) controlled. A multiple regression analysis support the hypothesis of a negative relationship between academic achievement and time spent listening to radio among ninth graders. Zulauf and Gortner (1999) examined the use of time and academic performance of 93 college students in Columbus, U. S. A. Both quantity of study time and quality time management skills were included in the study. A recursive regression analysis revealed that time management skills and study time were positively related with students quarterly grade point average (G.P.A.). Students' grade point average increased only 0.04 points (4.0 scales) per additional study hour suggesting that a substantial improvement in G.P.A. require substantial increase in study time. Dolton, Marcenaro and Navarro (2001) used data from the University of Malaga drawn from a survey conducted in April 1999 on first and final year students. Their sample included 3,722 observations taken from students from forty different subject areas. They found that class attendance was four times more productive than self-study in the linear specification of the stochastic educational production function. Using the Cobb-Douglas specification, the elasticity of performance with respect to attendance was found to be twice that of self-study time (on average 0.02 and 0.01 respectively). The authors addressed the problem of the potential endogeneity of pre-university performance but neglect that of students' time allocation. Bratti and Staffolani (2002) tried to remedy the shortcomings in the economic literature by investigating the relationship between university students' absenteeism and academic performance. They introduced a simple theoretical model in which students decide the optimal allocation of their time between lecture attendance, self-study and leisure. This way, the authors addressed the problem of the potential endogeneity of pre-university performance and students' time allocation and found a positive relationship between lecture attendance and time devoted to self-study in each course. From that, they infer that estimates of student performance regression which omit self-study might be biased. Thus, they estimated an academic performance regression using data from first year undergraduate students of economics and found evidence that once self-study is controlled, the positive and significant effects of lecture attendance for some courses disappear. None of the studies cited actually linked time utilization to gender and academic ability.

By conventional wisdom, one should think that spending time on academic activities will yield dividends in a form of high academic performance. This is what

the time-use researchers sought to establish. One may also think that one's disposition such as his gender or intellectual ability level will have an effect on the way he or she uses time and how that time use will influence his or her academic achievement. However, research (Dayioglu and Turut-Asik, 2004; Young and Fisler, 2000; OECD, 2001; Warrington and Williams, 1999) which investigated differences between males and females have focused their attention on academic achievement of males and females to the neglect of their time utilization. Young and Fisler (2000) examined SAT-M scores of higher school seniors and found males to score better than females. However, they note that males who took part in the study mostly came from households where the parents' socio-economic status is high. They failed to look at how male students generally use time.

Students' self-efficacy or academic ability has also been found to be important predictors of their academic achievement by previous researches. For example, Sakiz (2011); Vuong, Brown-Welty, and Tracz (2010) and Nasiriyani, Khezri Azar, Noruzy, and Dalvand (2011) have found that self-efficacy had a significant and positive effect on academic achievement. Britner and Pajares (2006) also found that self-efficacy was the best predictor of physics conceptual understanding as well as physics grade. Students with high self-efficacy tend to choose more challenging tasks, show more effort, and do not give up easily, which explains why students of similar ability can have different academic performance (Pajares, 1997). Students who have a strong belief that they can succeed in chemistry-related tasks and activities will be more likely to select such tasks and activities, and work hard to complete them successfully (Britner and Pajares, 2006).

Going by the assertions of the researchers, it is reasonable to suggest that time use differences between males and females and between students of different intellectual abilities can also account for the differences in their academic achievements. It is this area that this current researcher delves into to ascertain whether indeed significant differences exist between students of different intellectual abilities and gender in terms of time utilization. It appears that little research on time utilization among students of intellectual ability and gender in senior high schools has been carried out in Ghana. Therefore, there is a rationale for a new empirical study which will shed further light on the process by which time input is transformed into educational output. This study therefore investigated the differences that exist between students of different intellectual abilities and gender with regard to academic time utilization rates in senior high schools in the Northern Region of Ghana.

The results of this study will inform curriculum planners, school administrators, teachers and parents in dealing with issues relating to the differences between male and female students' intellectual ability and time utilization in secondary schools. Increase in female students' self-efficacy and time spent on academic activities could decrease the gap between male and female student academic achievement.

Literature review

Intellectual Ability and its Relationship with academic achievement

A student's academic ability appears to play a major role as a determinant of his or her use of academic learning time. Intellectual ability may be defined as the degree of competence in educational activities in such subjects as mathematics, science and English. In Ghana, standardized tests such as the Basic Education Certificate Examination or the West Africa Senior Secondary Certificate Examination in most cases are used to determine the intellectual ability or aptitude of students. The results of the Basic Education Certificate Examination, for instance, rank the students in terms of academic performance in the exams and are then used to determine whether a student is qualified for admission into the senior high school and for which programme of study.

A great deal of literature exists with regard to the link between Intellectual ability and academic achievement. Annette (2010), for instance, sought to investigate academic achievement patterns and their relationships with intellectual ability, social abilities, and problem behavior. A sample of 30 higher-functioning, 9-year-old children with autism spectrum disorder (ASD) participated in the study. Participants were tested for academic achievement and intellectual ability at age 9. Problem behaviors were assessed through parent report and social functioning through teacher report at age 6 and 9. Significant discrepancies between children's actual academic achievement and their expected achievement based on their intellectual ability were found in 27 of 30 (90%) children. Both lower than expected and higher than expected achievements were observed. Children with improved social skills at age 6 demonstrated higher levels of academic achievement, specifically word reading, at age 9.

Anggi Tias et al. (2015) investigated the contribution of intelligence quotient (IQ) on biology academic achievement of senior high school students in Medan, Indonesia. The results showed that there was a correlation between intelligence quotient (IQ) and Biology academic achievement with regression equation of $Y = -$

$11.587 + 0.882 X$ ($F = 324.490$, $a = 0.000$). The result of the R square analysis shows that IQ gives 57.7% contribution on Biology academic achievement.

Students' self-efficacy or academic ability has also been found to be important predictors of students' academic achievement by previous researches (Pajares, 1997; Britner and Pajares, 2006). Sakiz (2011) have found that self-efficacy had a significant and positive effect on academic achievement. Many studies have also shown that students of different intellectual ability differ with respect to time utilization on academic related activities (Idson and Clark, 2003; Grave, 2010). Idson and Clark (2003) sought to examine whether significant differences exist between students of different academic ability with regard to time allocation to school work, market work, and leisure activities. Based on a sample of undergraduate students at two U.S universities, they found that students with greater scholastic aptitude allocate greater amounts of time to studies and to market work while consuming lower amounts of leisure. In a related study, Zietz and Joshi (2005) examined the determinants of US students' use of time. An explicit theoretical framework grounded in optimizing behaviour was derived. The empirical work was also based on a National Longitudinal Survey of youth in 1997. The set of variables included student and family characteristics, peer behaviour, and students' involvement in work outside the school. The estimation results confirm the theoretical predictions. They suggest that academic aptitude, pre-high school academic performance, and lifetime consumption goals as driven by peer pressure and family background are by far the most important determinants of time use among adolescent children. One limitation associated with these studies is that, they focused more on non-academic related activities to the neglect of other academic related activities such as group and self-study activities. This is what the current study sought to address.

Grave (2010) investigated the effect of students' time allocation on the academic achievement of undergraduate students of Universities of applied sciences in Germany. The activities in Grave's (2010) study included self-study, group study, tutorials and class attendance. Grave (2010) found that across different ability strata distinguished by final high school grade, above average students devote significantly more time to both attending classes and self-study while less time is spent on group studies and employment. The results suggest that time spent on attending courses is positively associated with grades for females, high ability students and students of Social Sciences and Sciences/Engineering. Spending time on self-study, other study-related activities, working as a student assistant or tutor

is positively correlated with grades for almost all students. Devoting time for attending tutorials or student work groups is negatively correlated with grades if the ability of the students is below average or if they study Sciences/ Engineering. Grave study focused on an institution of high learning. The point of departure of this present study is that its concentration is on students of senior high schools in the Northern Region of Ghana.

Gender and Students Time Utilisation

Gender refers to the socially constructed roles of and relationship between men and women (International Platform on Sports and Development, 2013: 12). “The term gender holds promise for studies of the norms and expectations that influence people's behaviors in social contexts including school classrooms” (Glosser and Smith, 2008: 349). It is argued that gender concerns men and women including conceptions of both femininity and masculinity. In other words, gender does not mean focusing solely on women or females but rather on the inequalities between males and females and should not be confused with feminism or women studies (International Platform on Sports and Development, 2013: 12).

Gender role socialization theory states that males and females have different sets of values, attitudes and behaviors throughout their life-long socialization (West, Candance, Zimmerman, and Don, 1987: 14). Both females and males learn how to behave in society within the cultural norms of masculinity and femininity. Those different values, attitudes and behaviors seem to reflect in the educational system. Within this theoretical framework, it is safe to argue that males act differently from females in terms of time utilization in educational settings. Analysis of these gender differences appears to show a disadvantage and weaker position of women and girls in social, political, economic, legal educational and physical issues. Some researchers such as Mohammed, Atanga and Edawoke (2014), argue that socio-economic status, socio-cultural beliefs, unfavorable school environment, political and institutional conditions can affect female student academic achievement. For example, the financial and moral support provided to females for schooling is limited as compared to males (Teshome, 2003: 34). Ethiopian MoE (2004) explained that learning environment is a determining factor for female students' performance and survival at any given educational level. Odaga and Heneveld (1995) have also argued that the school environment, teachers' attitude and pedagogy, and gender bias in learning materials affect the performance and attainment of female students in schools. It thus appears that the male student gets more privileged treatment in school than the female

student. Going by this argument it is reasonable to assume that differences between male and female students' in academic achievement could be explained by differences in students' personal characteristics such as time utilization rates. This belief is supported by a small but steadily growing body of research. Some previous researchers examined the difference between male and female students in self-efficacy and academic engagement in different levels. It will therefore be more informative and beneficial to focus on the notion of gender. It is argued that reviewing the existing condition, focusing on male and female students is still valuable and important because the aim of this study is to examine the difference between male and female students in time utilization on academic activities.

Mohammed, Atanga, and Edawoke (2014) undertook a study to examine the male and female students' self-efficacy, academic engagement, and academic achievement in Biology among grade 10 students in South Wollo zone schools in Ethiopia. 192 males and 188 females grade ten students were selected from two schools to participate in the study. The authors employed the convenience sampling technique to sample the schools whereas the simple random sampling technique was used to sample the students. The results showed statistically insignificant differences between male and female students in academic engagement, although there was a slight mean difference in favour of male students. The results, however, indicated statistically significant differences between male and female students' self-efficacy and academic achievement in biology favoring male students. In India, the homework rates appeared much higher, with males from urban areas spending 3.9 hours and females 2.9 hours each day (Lloyd, Grant, and Ritchie, 2008: 14). Grave (2010) investigated the effect of student time allocation on the average grade of Undergraduate students, by gender, ability and field of study. The results suggest that between male and female students, men spend on average more time on student work groups or tutorials, while women spend more time on other study-related activities. Over time, the amount of time spent in these different activities stayed quite stable. Comparing 2006 to 1986, time spent on attending courses increased slightly whereas time spent on self-study decreased slightly. While women allocated in 2006 more time to attending student work groups or tutorials, and less time to other study related activities, men spent more time for working as a student assistant and less time on other employment.

Savas (2016) investigated gender and Race differences in higher school achievement in the United States. The purpose of the study was to examine

gender and racial/ethnic differences in high school achievement measured by students' high school GPAs and their standardized math and reading test scores. The Education Longitudinal Study of 2002 was used to investigate the following question: To what extent do school behaviors, attitudes toward school/teacher, students' educational expectations, and parental involvement and expectations impact gender and racial/ethnic differences in high school achievement? Results supported gender-role socialization theory. The results show that female students have higher educational expectations and parental support than their female counterparts. Male students were found to be more likely to have negative school behavior and are also more likely to spend less time on homework compared to female students. The results suggested that oppositional culture does not account for racial/ethnic differences but for gender differences in high school achievement given that gender differences in school resistance and educational expectations are consistent whereas race/ethnic differences are not.

The current study contributes to the literature in several respects. In the first place the population of study is quite different in the sense that it is concentrated on senior high school students in the Northern region of Ghana. Secondly the sample size of 500 is considered large enough to enhance generalization of the results. Unlike previous studies, this study sampled 7 schools across the length and breadth of the Northern region to participate in the study.

Theories relating to students Time Allocation, Gender and Intellectual Ability

Becker's Time Allocation Theory

The theory of time allocation based on Becker's (as cited in Grave, 2010) model of students' time allocation states that the individual student has a resource in a form of time at his disposal. He can apportion this time among competing activities most efficiently to maximize his output measured in grades. The amount of time apportioned to different activities by students and its effect on their examination performance is influenced by their different backgrounds such as gender and intellectual ability. This assumption is supported by Dolton et al.'s (2001) theory of student's time constraint and exam performance. The theory assumes that each student can convert time spent on self study, S , and time spent on formal education, F , into examination performance, P , but that this relation is conditional on their individual specific, innate ability (or intelligence) A .

$$P = P(F, S, A) \quad (2)$$

Where $P_F > 0$, $P_S > 0$ and $P_A > 0$.

The theory further assumes that there is diminishing returns to study time after

some amount of self-study and formal education (i.e. $PSS < 0$, $PFF < 0$) which may also be individual specific? This simple theory is rich enough to explain the possibility that some individuals who allocate less time to study may end up with higher examination performance, simply due to their higher ability and their more efficient conversion of study time to examination performance (Dolton et al. 2001: 16). The present study seeks to investigate this theory further.

The Spearman Two-Factor Intellectual Ability Theory

The English Psychologist, Charles Spearman (1863-1945) proposed his theory of intelligence called two-factor theory. According to him, intellectual abilities comprised of two factors, namely, the general ability known as G-factor and Specific ability known as S-factors. The performance by the individual is determined by the G-factor and the S-factor. The total intelligence of the individual is the sum total of the G-factor and the S-factor. This implies that the performance of a particular task depends on the G-factor and the particular S factor. Spearman indicated some features of general intellectual ability as follows:

1. It is universal inborn ability
2. It is a general mental energy
3. It is constant
4. The amount of G differs from individual to individual
5. It is used in every activity of life
6. The greater the 'G' in an individual, the greater is his success in life.

The features of the S-factor on the other hand include:

1. It is learnt and acquired in the environment
2. Individuals differ in the amount of S' ability.

By inference, Spearman sought to argue that the G-factor represents native intelligence. Thus, when one responds to any situation or performs an intellectual task, his or her general mental ability is responsible for it and that his or her specific ability in that particular task is responsible for the rest. There are a larger number of specific abilities such as ability to draw inferences, ability to complete sentences and the ability to code messages.

Different individuals differed in their G- as well as S factors. For example, an individual performance in literature is partly due to his general intelligence and partly due to his language. Spearman's theory seems to suggest that two individuals with different levels of G-factor and the S-factor may exhibit different

academic performance even if they spend the same amount of time on the same academic activity. This suggestion is supported by Dolton et al (2001) time allocation theory. The theory assumes that each student can convert time spent on self study, S , and time spent on formal education, F , into examination performance, P , but that this relation is conditional on their, individual specific, innate ability (or intelligence) A . This current study seeks to investigate these theories in a different environment to ascertain whether in deed they pertain.

Gender Role Socialization Theory

Gender role socialization theory states that males and females have different sets of values, attitudes and behaviors throughout their life-long socialization (West, Candance, Zimmerman, and Don, 1987, p. 12). Both females and males learn how to behave in society within the cultural norms of masculinity and femininity. Those different values, attitudes and behaviors seem to reflect in the educational system. Within this theoretical framework, it is safe to argue that males act differently from females in terms of time utilization in educational settings. If males and females have value differences it is also possible they have different value attachment to time which invariably may affect the amount of time they spend on academic related activities. It is also possible that girls may spend equal amount of time with boys in class attendance but girls' shireness or lack of self confidence resulting from the way they are socialized, may keep them from participating in class and hence may achieve low academic performance. Analysis of these gender differences appears to show a disadvantage and weaker position of women and girls in social, political, economic, legal educational and physical issues. Some researchers (Mohammed, Atanga and Edawoke, 2014) argue that socio-economic status, socio-cultural beliefs, unfavorable school environment, political and institutional conditions can affect female student academic achievement. These factors might place limitations on the rate at which females use academic learning time hence their poor performance in school.

Statement of the Problem

Time is one of the most important resources in human society. In most educational institutions for instance, one of the major resources that apparently determine how successful they are in the achievement of their objectives is the availability of time and how it is utilised. It appears that educational institutions are often challenged with the issue of effective time allocation. The question is how well do students manage time available to them for studies? And does the time spent on or allocated on the activities dependent on intellectual ability and gender?

Although there have been many studies on students' academic achievement, the evidence would suggest that there is still a long way from understanding how education is produced in terms of how hours of studying is transformed into knowledge. Therefore, there is a rationale for a new empirical study which will shed further light on the process by which time input is transformed into educational output. However no matter what other activities students may engage in, it is important that they prioritize the need to achieve academic excellence and such achievement is relation to time allocated (Ogundepe and Falade, 2014). This study therefore investigated students' time utilization and academic achievement by gender and intellectual ability. The characteristics of the target population used are quite different in that it concentrates on students of public senior high schools in the Northern Region of Ghana.

Methodology

This study employed the cross-sectional survey research design to investigate the differences that exist between males and females as well as high and low intellectual ability of students in senior high schools with respect to time allocation in the Northern Region of Ghana. The population for the study was all second year students of public senior high schools in the Northern Region of Ghana. The rational for using the second year students was that unlike the first year students, they had little adjustment problems because they were in school long enough to adjust to the environment. Secondly, second year students had cumulative terminal examination records for at least one year providing an opportunity for the researcher to use them as proxy for academic achievement. Using just one terminal examination records of students as was the case of first year students might have been bias because the students, due to some conditions, would have either passed very well or fail. Using examination scores for three or four terms as proxy for academic achievement therefore provided fair grounds for analysis of what the student was capable of achieving.

Second year public senior high schools in the Northern Region of Ghana have a population of 15,325 second year senior high school students (Northern Regional directorate of education, 2013). The Northern Region is made up of 26 districts which are further categorized into seven zones based on cultural, ethnic and socio-cultural settings. One school was purposively selected from each zone to ensure that all schools sampled offered uniform academic programs so as to provide a fair basis for comparisons.

The proportional sampling technique was used to sample students in each senior high school. The stratified random sampling technique was also used for the sampling of students in each of the programmes. The students were classified into strata in each of the programmes based on sex, and then randomly selected using the lottery method.

A sample size of 500 respondents was used for the study. The sample size for the study was determined using the formula by Krejcie and Morgan (1970), which is used to calculate a sample size (s), from a given finite population (P) such that the sample will be within plus or minus 0.05 of the population proportion with a 95 per cent level of confidence. This formula is presented in equation 1

Equation 1:

$$S = \frac{X^2NP(1-P)}{d^2(N-1) + X^2P(1-P)}$$

Where:

X²= table value of Chi-Square for 1 degree of freedom at the desired confidence level (in this case 3.84)

N = the population size, in this case 15,325

P = the population proportion (assumed to be .5 since this would provide the maximum sample Size)

d = the degree of accuracy expressed as a proportion (.05)

Computing the desired sample size using this formula gave 389 as the minimum number of respondents that should be selected from a population of 15,325 second year senior high school students. Therefore, sample size of 500 respondents used facilitated the estimation of the influence of students' time allocation on academic achievement for the different sub-groups namely; males and females, below and above average students.

A questionnaire was used to collect the data from the students. The instrument was pre-tested using a sample of 100 students drawn from five (5) different senior high schools. The schools were selected using the simple random sampling technique. The Cronbach's alpha analysis gave an alpha value of 0.7 indicating a

strong internal consistency of the items.

Results

This study sought to determine the extent to which students of different intellectual ability and gender in senior high schools in the Northern Region of Ghana differ with respect to time spent on class attendance, group study and self-study. It further wanted to determine whether there was any significant influence of students' time utilization on academic achievement for males and females as well as high and low academic ability students. The results are as follows:

Intellectual Ability and Time Utilisation

The Basic Education Certificate Examination score of the students was used as proxy for their intellectual ability. Aggregate 6-15 was defined as high ability and coded 2 while aggregate 16 and above were defined as lower ability and coded 1. The mean difference in time allocation by the two ability groups is shown in Table 1.

Table 1: Mean Differences in Utilization by High and Low Ability Students

Ability	Class Attendance			Self-Study			Group Study		
	Frequency	Mean	SD	Frequency	Mean	SD	Frequency	Mean	SD
High	336	3.1	1.4	336	2.3	1.3	336	3.3	1.6
Low	164	3.4	1.2	164	2.9	1.2	164	3.2	1.7

Source: Field survey 2013. SD = Standard deviation

The results revealed that low and high academic ability students differ significantly with respect to the time they spend on self-study ($F(1, 498, p = .00)$) with means ranging from 2.3 to 2.9. and class attendance ($F(1, 498, p = .043)$) with means ranging from 3.1 to 3.4. With regard to the influence of the ability variable on academic achievement, Table 2 shows the results of the regression analysis of the impact of time use variables on academic achievement for high and low academic ability students. The analysis was done separately for low ability and high ability students.

Table 2: The Influence of Time Utilization on Academic Achievement by Ability Levels

Variable	High Ability			Low- Ability		
	B	β	ρ	B.	β	ρ
Class attendance	.020	.057	.370	.141	.350	.001
Group Study	.001	.003	.162	.058	.194	.002
Self- Study	-.039	-.103	.091	-.013	-.032	.623
Religious Activities	.059	.143	.020	.038	.075	.261
Age	-.024	-.032	.605	-.038	-.034	.613
Religion	.138	.139	.026	-.030	-.023	.728
Boarding status	.020	.020	.746	-.028	.115	.082
Programme of Study	.056	.084	.172	.122	.022	.745
Mothers Education	.007	.017	.815	.013	.068	.364
Fathers Education	-.016	-.048	.499	.023	-.075	.340
Gender	.088	.087	.167	-.246	-.247	.000

Significant @ 95% Level of Confidence

*($R^2 = 0.17$ adjusted $R^2 = 0.13$, $F(11, 269) = 1.9$, $p = 0.035$). * High Ability

** ($R^2 = 0.22$ adjusted $R^2 = 0.18$, $F(11, 206) = 5$, $p = 0.001$). ** Low ability
 $P < 0.05$. Source: Field survey 2013

The linear combination of time use variables and students background characteristics was significantly related to academic achievement for both high ability (adjusted $R^2 = 0.13$, $F(11, 269) = 1.9$, $p = 0.035$) and lower ability students (adjusted $R^2 = 0.18$, $F(11, 206) = 5$, $p = 0.001$). This is an indication that 17% and 18% of variation in academic achievement can be explained by the combined effect of students' background characteristics and time spent on class attendance, group study, self-study and religious activities for low and high ability students respectively.

The influence of class attendance time on academic achievement was significant and positive for lower ability students ($\beta= 0.350$, $p =0.001$) but insignificant for high ability students ($\beta= 0.016$, $p =0.370$). Group studies time had positive and significant impact on academic achievement for lower ability students ($\beta =0.197$, $p = 0.002$). The impact was however insignificant for high ability students ($\beta= 0.003$, $p=0.162$).

Gender and Time Allocation

The mean differences in time allocation by male and female students are shown in table 3.

Table 3. Mean Differences in Time Allocation by Male and Female Students

Gender	Class Attendance			Self-Study			Group Study		
	Frequency	Mean	SD	Frequency	Mean	SD	Frequency	Mean	SD
Male	289	3.6	1.3	289	2.6	1.3	289	3.9	1.6
Female	211	3.2	1.4	211	2.3	1.2	211	3.1	1.7

Source: Field survey 2013, SD stands for Standard deviation.

The results revealed that male and female students differ significantly with respect to the time they spend on class attendance ($F(1, 498) = 1.5$, $p = .043$) with means ranging from 3.2 to 3.6.; Self-Study ($F(1, 498) = 11$, $p = .043$) with means ranging from 2.3 to 2.6 and group study ($F(1, 498) = 2$, $p = .015$) with means ranging from 3.1 to 3.9. The findings are consistent with the research results of the Ghana statistical service (2012), Larson and Verma (1999), Grave (2010) and Ahmad (2014) who found significant differences with respect to time allocation between males and females. Table 4 below shows the results of the influence of time allocation and students background characteristics on academic achievement by sex. The analyses were done separately for males and females.

Table 4: Influence of Utilization on Academic Achievement for Males and Females

Variable	Male			Female		
	<i>B.</i>	β	ρ	<i>B.</i>	β	ρ
Class attendance	.100	.265	.004	.035	.101	.163
Group Study	.050	.165	.879	.017	.057	.393
Self- Study	.003	.009	.888	.071	.177	.009
Religious Activities	.004	.008	.012	.128	.277	.000
Age	-.024	-.032	.586	-.035	-.040	.551
Religion	.136	.132	.030	.003	.003	.109
Boarding status	.046	.144	.015	-.120	-.116	.089
Programme of Study	.036	.052	.364	.021	.035	.612
Mothers Education	.014	.037	.585	-.023	-.057	.409
Fathers Education	-.011	-.036	.602	.005	.015	.854
Ability	-.089	-.088	.138	.195	.195	.010
Significant @ 95% Level of Confidence						

* $R^2 = 0.36$ adjusted $R^2 = 0.13$, $F(11, 273) = 3.9$, $p = 0.001$). * Males $P < 0.05$.

Source: Field survey 2013

** ($R^2 = 0.40$, adjusted $R^2 = 0.16$, ($F(11, 202) = 3.5$, $p = 0.006$). ** Females

The linear combination of the time used variables was significantly related to academic achievement for both males (adjusted $R^2 = 0.13$, $F(11, 273) = 3.9$, $p = 0.001$) and females (adjusted $R^2 = 0.16$, $F(11, 202) = 3.5$, $p = 0.006$). This suggests that 36% and 40% of the variation in academic achievements of males and females respectively is explained by the combined influence of their background characteristics and the time they spend on class attendance, self-study, group study and religious activities.

The influence of class attendance time on academic achievement is positive and significant for males ($\beta = 0.265$, $p = 0.004$) but statistically insignificant for females ($\beta = 0.101$, $p = 0.163$). Grave (2010) however found that investing time in attending classes is positively associated with grades only for female students. The influence of group study time on academic achievement is also insignificant for males ($\beta = 0.165$, $p = 0.879$) and females ($\beta = 0.057$, $p = 0.393$). This is also contrary to Grave (2010) report that says that spending time on student group studies is not associated with grades for both males and females. Self-study time has positive and significant influence on academic achievement for females ($\beta = 0.177$, $p = 0.009$) but has insignificant influence on academic achievement for males ($\beta = 0.009$, $p = 0.888$). This is inconsistent with Grave (2010) who found that time spent on self-study, has a significant positive correlation with academic achievement for both males and females.

The analyses also revealed that time spent on self-studies has insignificant influence on academic achievement for both groups. Religious activities time however had positive and significant impact on academic achievement for high ability students ($\beta = 0.143$, $p = 0.02$) but insignificant impact on academic achievement for lower ability students ($\beta = 0.075$, $p = 0.26$).

Discussion

The findings do not support those of Grave (2010) who found significant differences in terms of time utilization between males and females. Her results also suggest that time spent on attending courses is positively associated with grades for females, high ability students and students of Social Sciences and Sciences/Engineering. The variance might possibly be due to the fact that her study took place in an institution of higher learning whose academic learning environment is completely different from that of senior high schools. Age and maturity also appear to play an important part in determining academic achievement of students and it might have been the result of the level of maturity

of Graves's subjects not only the time they devoted to academic related activities. The results also failed to conform to that of Idson and Clark (2003) who found that students with greater scholastic aptitude allocate greater amounts of time to studies and to market work while consuming lower amounts of leisure. Zietz and Joshi (2005) suggested that academic aptitude is by far the most important determinants of time use among adolescent children.

The results confirms Becker's and by extension Dolton et al.'s (2001) theoretical model of students time allocation. In their theoretical model of students' time allocation, Dolton et al. (2001) explained the possibility that some individuals who allocate less time to study may end up with higher examination performance, simply due to their higher ability and their more efficient conversion of study time to examination performance. Sakiz (2011); Vuong, Brown-Welty, and Tracz, (2010); Nasiriyah, Khezri Azar, Noruzy, and Dalvand, (2011) had also identified self-efficacy to be an important determinant of academic achievement. Relating this argument to the current findings it is safe to say that spending more or less time in academic related activities may not necessary have significant impact on the academic performance of academic gifted children. It is the confidence that high ability students have in their natural ability to do well that counts. Low achieving students due their slow pace of learning rather need more time to study and hence much time should be devoted to them for studies.

The results also confirms the English Psychologist, Charles Spearman's (1863-1945) theory of intelligence called two-factor theory. According to him, intellectual abilities are comprised of two factors, namely, the general ability known as G-factor and Specific ability known as S-factors. The performance by the individual is determined by the G-factor and the S-factor. The total intelligence of the individual is the sum total of the G-factor and the S-factor. The performance of a particular task depends on the G-factor or general ability and the particular S factor or specific ability. Spearman indicated some features the general intellectual ability as follows. It is not necessarily the amount of time devoted to a particular task that matters but one's intelligence in converting the time to actual learning.

The results suggest that the amount of time girls spend on class attendance and group study have no significant impact on their academic achievement. It may not necessary be the amount of time that one devotes for group study or class attendance that significantly influences academic achievement but what one

does during group or class discussions. It appears that the gender stereotyping makes the female student feel inferior to the male child. This is a confirmation of the gender role socialization theory which states that males and females have different sets of values, attitudes and behaviors throughout their life-long socialization (West, Candance, Zimmerman, and Don, 1987: 12). Milto and Roger (2002) reported that differences in attitude and achievement also affect female interaction when working within groups. They explained that females feel less confident than their male counterparts and may be less assertive. According to them, research suggests that females often feel their comments are incorrect and that have little input to offer groups. This behaviour is especially true for groups comprised of both sexes. Females prefer to work in same-sex lab groups. Perhaps this is because females' lower confidence combined with boys' desire to control scientific activities lowers females' interest and involvement in physical, even leading to feelings of alienation in extreme cases.

Another factor that may influence females' behaviour when involved in engineering tasks is the introduction of competition (Milto and Roger, 2002). Females traditionally prefer cooperative modes of learning rather than competitions. Females tend to be overshadowed by competition while males flourish in competitive settings. World Bank (2012) contended that most girls hardly take part in class discussion. The Bank identified this as one of the contributory factors of their underperformance (World Bank, 2012). Some researchers (Mohammed, Atanga and Edawoke, 2014) argue that socio-economic status, socio-cultural beliefs, unfavorable school environment, political and institutional conditions can affect female student academic achievement. For example, the financial and moral support provided to females for schooling is limited as compared to males (Teshome, 2003). Ethiopian MoE (2004) explained that learning environment is a determining factor for female students' performance and survival at any given educational level. These gender bias societal conditions that do not favour the female student should be looked at critically.

Conclusion

The study finds conclusive evidence that male and female students differ significantly with respect to the time they spend on class attendance. Females spend slightly higher amount of time attending classes than their male counterparts. This evidence support gender role socialization theory which states that males and females have different sets of values, attitudes and behaviors

throughout their life-long socialization. Female students seem to place more value on class attendance than their male counterparts. However, the time they spend attending classes has insignificant influence on their academic achievement. This suggests that even though there might be great differences with respect to the seriousness both sexes attach to class attendance (a confirmation of the gender role socialization theory), females do not get as much impact as their male counterparts.

The study also finds evidence that high and low intellectual ability students differ significantly with respect to the time they spend attending classes with low intellectual ability students spending slightly higher amounts of time but the impact on their academic achievement isn't as great as the higher intellectual ability students. This goes to confirm Becker's and by extension Dolton et al. (2001) model of student's time constraint and exam performance. The theory assumes that each student can convert time spent on self-study, S , and time spent on formal education, F , into examination performance, P , but that this relation is conditional on their, individual specific, innate ability (or intelligence) A .

$$P = P(F, S, A) \quad (2)$$

Where $P_F > 0$, $P_S > 0$ and $P_A > 0$.

The theory further assumes that there is diminishing returns to study time after some amount of self-study and formal education (i.e. $P_{SS} < 0$, $P_{FF} < 0$) which may also be individual specific? This simple theory is rich enough to explain the possibility that some individuals who allocate less time to study may end up with higher exam performance, simply due to their higher ability and their more efficient conversion of study time to exam performance (Dolton et al. 2001). The current results buttress the theory that spending more time on academic related activities yields returns in a form of increase academic performance but the extent to which that will happen depends on the persons intellectual ability of efficiently converting this study time to academic achievement.

The Evidence also supports Spearman's theory of intellectual ability which states categorically that individuals differ in both General intelligence and specific intelligence and that these differences reflect in their academic performance. Time allocation might play a role but the significant impact on academic performance is exerted by intelligence.

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