

DETERMINANTS OF ACADEMIC ACHIEVEMENT AT HIGHER EDUCATION

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Abstract

The purpose of the present study was to explore the determinants of students' academic achievement as well as gender based differences of these determinants in social and natural sciences. We selected 807 students (male = 504, female = 303) from Bahauddin Zakariya University by using multi-stage stratified random sampling and the data was collected through self-administered questionnaire whereas parenting style was measure by Lamborn, et al. (1991) questionnaire. Difference of teacher behavior toward male and female students in social and natural sciences was identified. It was explored that teachers' politeness and time spend on studies by students have significant effect on academic achievement. The study suggested that teachers should be unbiased regarding gender during teaching and students should be more time devoted to their studies.

Keywords: learning styles; academic achievement; higher education

1. Introduction

The academic achievement of students is positively associated with socioeconomic (Akhtar, 2012; Barry, 2006; Shimada, 2010) but it has no sufficient influence on the learnings of students (Adeyemo & Babajide, 2012). Moreover, gender also effects the learning achievement of students (Gillies & Boyle, 2010) particularly the performance of female (Akhtar, 2010; Buckner, Bassuk, & Weinreb, 2001; Draper & Porter, 2004; İşman, 2014) due to the male students (Cheng & McEwan, 2012). The involvement of teacher (Kukemelk, Lillemaa, & Tondi, 2011) teachers' politeness (Wang et al., 2008) and teachers' knowledge (Metzler & Woessmann, 2012) also enhance the learning achievement of students. Beside these, students' academic achievement is also associated with qualification of parents (Azhar, Nadeem, Naz, Perveen, & Sameen, 2013; Jabor, Machtmes, Kungu, Buntat, & Nordin, 2011) and their occupation as well (Farooq, Chaudhry, Shafiq, & Berhanu, 2011a). Furthermore, physical health (Lê-Scherban, Roux, Li, & Morgenstern, 2014) and anxiety (Wittmaier, 1972) influence learning achievement of students.

It has been also found that the peer group either enhances (King, 1990) or decreases the learning ability (Iyer, Kochenderfer-Ladd, Eisenberg, & Thompson, 2010). In addition to this, learning achievement varies from student to student in different subjects (Rost, Sparfeldt, Dickhäuser, & Schilling, 2005) due to the difference of IQ level (Hughes, 1983; Jensen, 1989) and time spends on studies (Jez & Wassmer, 2013; Nonis & Hudson, 2006). There is also a racial difference in students' achievement (Buckner et al., 2001). As far as the economic background of students concerns, the researchers found that the grades of poor students are less than the rich students (Moller, Stearns, Blau, & Land, 2006). In extracurricular activities, learning achievement are effected by sports (Papaioannou, Ampatzoglou, Kalogiannis, & Sagovits, 2008) and computer games (Divjak & Tomić, 2011).

2. Literature Review

Socio-economic status effects the academic achievement (Akhtar, 2012; Barry, 2006), such findings are supported in mathematics (Ojimba, 2013; Shah, Atta, Qureshi, & Shah, 2012). It has been identified that families with high and mediocre socio-economic status led students to achieve higher grades as compare to the low one (Azhar et al., 2013; Farooq, Chaudhry, Shafiq, & Berhanu, 2011b) because they are unable to reach their academic potential (Horwitz & Kerker, 2001). It is also identified that socio-economic disadvantages have no significant influence on the learning achievement of students (Adeyemo & Babajide, 2012).

Gender is another influential factor of academic achievement (Gillies & Boyle, 2010; Guiso, Monte, Sapienza, & Zingales, 2008; Moss-Racusin, Dovidio, Brescoll, Graham, & Handelsman, 2012). It has been explored that female students performed better than male (Akhtar, 2010; Buckner et al., 2001; Draper & Porter, 2004; İşman, 2014) especially in mathematics and English (Farooq et al., 2011b). However, on the other hand, boys have higher grades than females in over all natural sciences (Sadker, 1999; Watten & Watten, 2013).

Teachers' efficacy surely increased the efficacy of students (Ross, 1998; Ross, Hogaboam-Gray, & Hannay, 2001). Their involvement in class activities and student's healthy interaction with them contributed to accomplish their learning goals and developed new understanding (Caprara, Barbaranelli, Steca, & Malone, 2006). It reflected the teachers' interest that increased the grades of students (Kukemelk et al., 2011) but interest only does not positively affect rather the knowledge of teachers is also responsible for students' achievement (Metzler & Woessmann, 2012). Hence, the performance of those students have been higher who have proper guidance and instructions of instructors than those who have not been facilitated with such advantages (Anania, 1983). In nutshell, several factors e.g. family structure (Adeyemo & Babajide, 2012; Barry, 2006; Kuan & Yang, 2004; Milevsky, Schlechter, Netter, & Keehn, 2007), parental education (Azhar et al., 2013; Jabor et al., 2011), parental occupation (Barry, 2006; Desforges & Abouchaar, 2003; Farooq et al., 2011b), parental interest (Crowley, Callanan, Tenenbaum, & Allen, 2001), learning style (Abidin, Rezaee, Abdullah, & Singh, 2011; Beauchamp & Kennewell, 2010), pedagogical practice (Gillies & Boyle, 2010; Wang et al., 2008), peer group (Burke & Sass, 2013), health (Ding, Lehrer, Rosenquist, & Audrain-McGovern, 2009; Joe, Joe, & Rowley, 2009), psychological aspects (Gulzar, Ali, Aijaz, & Hussain, 2010; Wittmaier, 1972), educational

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environment (Abbott, 1981), race (Buckner et al., 2001), learning time (Gijsselaers & Schmidt, 1995; Jez & Wassmer, 2013; McFadden & Dart, 1992; Sedlacek & Sheu, 2004), IQ level (Jensen, 1981) and computer games (Divjak & Tomić, 2011; Kovačević, Minović, Milovanović, De Pablos, & Starčević, 2013) have been reported in different fields of study that effect the academic achievement of students.

3. Methodology

We used multi-stage stratified random sampling technique to select the true representatives of the population. At the first stage, the list of the faculties of Bahauddin Zakariya University was taken and it was re-classified with respect to the social sciences and natural sciences strata. After the re-classification of faculties, departments from each stratum were selected for the data collection. The first stratum comprised the departments of social sciences and the second stratum is composed of the departments of natural sciences. We randomly selected 807 students as a sample for the study (male = 504, female = 303).

Except parenting style, we used the self-administered questionnaire to measure the factors that may affect the academic achievement of students. We used the parenting style questionnaire of Lamborn, et al. (1991) that aimed to measure the parental behavior with students in relation with students' academic performance. The questionnaire comprised 29 questions that measure the parental behavior with students on five points likert scale ranging from strongly agree to strongly disagree. The academic achievement of students was measured through binary alternatives that codified as 0 = Not passed last semester; 1 = Have passed last semester, because we aimed to use Binary Logistic Regression for analysis. However, two independent sample t-test was applied to identify the differences of selected factors between male and female students studying in the faculties i.e., social and natural sciences, of the university.

4. Results

The two independent sample t-test was used to explore the difference of factors affecting academic achievement of the students in departments of social sciences. It was found that male spent more time on studies ($M = 4.00$, $SD = 2.708$) as compare to females ($M = 1.45$, $SD = .522$) in the department of political sciences, $t(6.285) = 2.458$, $p = .000$ and parents, $t(16) = .321$, $p = .005$ are more concerned for their children's studies ($M = 65.14$, $SD = 10.156$). Male students were granted higher teacher involvement ($M = 4.08$, $SD = .515$) in their studies in sociology department, $t(36.543) = 1.382$, $p = .025$, while in the department of philosophy teachers are more concern about female students. They motivate ($M = 4.25$, $SD = .50$) them and treat them more politely ($M = 4.50$, $SD = 1.0$) as compare to male ($M = 4.00$, $SD = .000$) nevertheless female students prefer to study independently $t(5) = -2.535$, $p = .052$, therefore, females have more healthy interaction with teachers ($M = 4.00$, $SD = .000$) as compare to male ($M = 3.75$, $SD = .957$) in this department, $t(3.00) = .522$, $p = .027$. As far as other factors concern, there was no significant difference found between male and female students in the departments of social sciences.

We also used two independent sample t-test to measure the differences of the selected factors affecting students' academic achievement in the departments of natural sciences. It was found that teacher involvement in the studies of male students ($M = 3.33$, $SD = 1.225$) is higher than female ($M = 2.03$, $SD = 0.763$) in departments of Botany, $t(8.000) = 1.633$, $p = .009$, and Zoology, $t(7.209) = .376$, $p = .026$. However, female students have healthy interaction with teachers ($M = 4.50$, $SD = .548$, $t(9.283) = -1.5$, $p = .04$), and parents are more caring about their studies ($M = 69.0$, $SD = 5.47$, $t(11.22) = -.84$, $p = .024$) as compare to male students in the Zoology department. An interesting fact was also found that female students' physical fitness ($M = 15.0$, $SD = 1.87$) is greater than male student ($M = 12.0$, $SD = 3.8$) in Botany department, $t(5.009) = -1.7$, $p = .02$. In the department of Chemistry, male students are slightly higher mentally relaxed ($M = 20.0$, $SD = 1.53$) than female students ($M = 19.90$, $SD = 4.42$, $t(11.820) = .132$, $p = .037$).

Table 1 comprised the results of binary logistic regression. Hosmer and Lemeshow test value was non-significant which showed a significant goodness-of-fit of the model ($\chi^2 = 5.836$, $p = .666$). The table also showed that time spent on study ($B = .323$, $OR = 1.381$, $p = .030$) and teacher politeness ($B = .531$, $OR = 1.700$, $p = .033$) had significant partial effects ($p < .05$) on the outcome.

Table 1: Determinants of academic achievement

Variables	B	Wald	p	Odd ratio
Age	.052	.143	.705	1.053
Father's education	.244	2.339	.126	1.277
Mother's education	.121	.640	.424	.886
Time spent on study per day	.323	4.725	.030	1.381
Peer participation in study	.357	1.141	.285	.700
Teacher involvement	.566	2.790	.095	.568
Teacher motivation	.171	.578	.447	1.186
Teacher politeness	.531	4.521	.033	1.700
Independent study	-.324	1.879	.170	.723
Student teacher healthy interaction	.098	.227	.634	1.103
Mantel relaxation	.005	.001	.982	1.005
Physical fitness	.325	.994	.319	.722
Parenting style	.046	1.771	.183	.955

5. Discussion

The purpose of the present study was to identify the factors which effect the learning achievement of the students and the magnitude of differences of these factors among male and female students in faculties of social and natural sciences. It has been successfully identified from the departments of Philosophy that teachers are more concerned about the studies of female students as compare to male students; they motivate and treat them politely. Moreover, female students had healthy interaction with teachers, and they preferred independent studies. These findings are parallel to the findings of Akhtar, (2010), Buckner, Bassuk, & Weinreb, (2001), Draper & Porter, (2004), İşman, (2014). Some contrary results were produced from the department of sociology in which teachers involve more in male students learning instead of female students. This finding supported the study of Sadker, (1999). It was also identified that in the department of Political sciences, male spent more time

on studies as compared to female. However, no gender-based difference of attitude of teachers were identified in the department. This finding supported the study of Sedlacek & Sheu, (2004) whereas Guiso, et. al., (2008) reported contrary results. Moreover, the parents are more concerned to the studies of the male children as compare to female children in the same department. This finding was consistent with Crowley et. al., (2001).

The findings from the faculty of natural sciences revealed that the teachers have higher involvement in the studies of male students than female students in the departments of Botany and Zoology. These findings are corresponding to studies of Watten & Watten, (2013). On the other hand, female students have healthy interaction with teachers and parents are more concerned with their studies as compare to male students in the department of Zoology. There were interesting findings from the department of Chemistry and Physics that male and female students have no difference of selected factors except mental relaxation – male students have higher relaxation in Chemistry department. Depicting gender biased attitude of teachers, the findings from these two departments are contrary to Moss-Racusin, et. al. (2012).

Lastly, model of academic achievement determinants showed that time spent of studies and teacher politeness positively affected the academic achievement of students. The findings supported the studies of McFadden & Dart (1992), Nonis & Hudson (2006). Both of these concluded that academic achievement can be determined by time spent on studies.

6. Conclusion

It was concluded that the factors affecting academic achievement varied by gender in social and natural sciences. Gender biased behavior of teachers was also identified in both faculties while logistic model inferred that academic behavior of male and female students can be explained by teachers' politeness and time spent on study. The present study suggests that in co-education, teacher should not be gender biased and should be polite with students. However, students should spend more time on their studies to enhance their academic achievement.

References

- Abbott, A. A. (1981). Factors related to third grade achievement: Self-perception, classroom composition, sex, and race. *Contemporary Educational Psychology*, 6(2), 167-179.
- Abidin, M. J. Z., Rezaee, A. A., Abdullah, H. N., & Singh, K. K. B. (2011). Learning styles and overall academic achievement in a specific educational system. *International Journal of Humanities and Social Science*, 1(10), 143-152.
- Adeyemo, S. A., & Babajide, V. T. (2012). The Influence of Social and Economic Disadvantage on Students' Academic Achievement in Senior Secondary Schools Physics. *International Journal of Educational Research & Technology*, 3(2), 03-10.
- Akhtar, Z. (2010). *The Effects of Learning Styles and Socio-economic Status on Learning Achievement of Secondary School Students*. National University of Modern Language.
- Akhtar, Z. (2012). Socio-economic Status Factors Effecting the Students Achievement: A Predictive Study. *International Journal of Social Sciences & Education*, 2(1), 281-287.
- Anania, J. (1983). The influence of instructional conditions on student learning and achievement. *Evaluation in education*, 7(1), 1-92.
- Azhar, M., Nadeem, S., Naz, F., Perveen, F., & Sameen, A. (2013). Impact of parental education and socio-economic status on the academic achievements of university students. *International Journal of Academic Research and Reflection*, 1(3), 25-33.
- Barry, J. (2006). *The effect of socio-economic status on academic achievement*. Wichita State University.
- Beauchamp, G., & Kennewell, S. (2010). Interactivity in the classroom and its impact on learning. *Computers & Education*, 54(3), 759-766.
- Buckner, J. C., Bassuk, E. L., & Weinreb, L. F. (2001). Predictors of academic achievement among homeless and low-income housed children. *Journal of School Psychology*, 39(1), 45-69.
- Burke, M. A., & Sass, T. R. (2013). Classroom peer effects and student achievement. *Journal of Labor Economics*, 31(1), 51-82.
- Caprara, G. V., Barbaranelli, C., Steca, P., & Malone, P. S. (2006). Teachers' self-efficacy beliefs as determinants of job satisfaction and students' academic achievement: A study at the school level. *Journal of School Psychology*, 44(6), 473-490.
- Cheng, J. Y.-J., & McEwan, P. J. (2012). Classroom Gender Composition and Academic Outcomes: Evidence from Male Cross-Registration at a Women's College.
- Crowley, K., Callanan, M. A., Tenenbaum, H. R., & Allen, E. (2001). Parents explain more often to boys than to girls during shared scientific thinking. *Psychological Science*, 12(3), 258-261.
- Desforges, C., & Abouchar, A. (2003). The impact of parental involvement, parental support and family education on pupil achievements and adjustment: A literature review (D. f. E. a. Skills, Trans.).
- Ding, W., Lehrer, S. F., Rosenquist, J. N., & Audrain-McGovern, J. (2009). The impact of poor health on academic performance: New evidence using genetic markers. *Journal of Health Economics*, 28(3), 578-597.
- Divjak, B., & Tomić, D. (2011). The impact of Game-based learning on the achievement of learning goals and motivation for learning mathematics-literature review. *Journal of Information and Organizational Sciences*, 35(1), 15-30.
- Draper, & Porter, S. R. (2004). *The Effects of Gender Grouping and Learning Style on Student Curiosity in Modular Technology Education Laboratories*. Virginia Polytechnic Institute and State University.
- Farooq, M., Chaudhry, A., Shafiq, M., & Berhanu, G. (2011a). Factors affecting students' quality of academic performance: a case of secondary school level. *Journal of Quality and Technology Management*, 7(2), 01-14.
- Farooq, M., Chaudhry, A., Shafiq, M., & Berhanu, G. (2011b). Factors affecting students' quality of academic performance: a case of secondary school level. *Journal of Quality and Technology Management*, 7(2), 01.
- Gijselaers, W. H., & Schmidt, H. G. (1995). Effects of quantity of instruction on time spent on learning and achievement. *Educational Research and Evaluation*, 1(2), 183-201.
- Gillies, R. M., & Boyle, M. (2010). Teachers' reflections on cooperative learning: Issues of implementation. *Teaching and Teacher Education*, 26(4), 933-940.
- Guiso, L., Monte, F., Sapienza, P., & Zingales, L. (2008). Culture, gender, and math. *Science New York then Washington* 320(5880), 1164.
- Gulzar, S. A., Ali, T. S., Aijaz, A., & Hussain, N. (2010). The influence of psychosocial factors on academic performance of adolescents: a quality assurance project. *Journal of the College of Physicians and Surgeons Pakistan*, 20(7), 494.
- Horwitz, S. M., & Kerker, B. D. (2001). Impediments to employment under welfare reform: The importance of physical health

- and psychosocial characteristics. *Women & Health*, 32(1-2), 101-117.
- Hughes, O. L. (1983). A comparison of error based and time based learning measures as predictors of general intelligence. *Intelligence*, 7(1), 9-26.
- İşman, A. (2014). Dimensional and interactive Istanbul university virtual laboratory based on active learning Methods *Turkish Online Journal of Educational Technology*, 13(1), 73-78.
- Iyer, R. V., Kochenderfer-Ladd, B., Eisenberg, N., & Thompson, M. (2010). Peer victimization and effortful control: Relations to school engagement and academic achievement. *Merrill-Palmer quarterly (Wayne State University. Press)*, 56(3), 361.
- Jabor, K., Machtmes, K., Kungu, K., Buntat, Y., & Nordin, M. S. (2011). Does Parent Educational Status Matter on the Students' Achievement in Science. *International Conference on Social Science and Humanity*, 5(1), 309-313.
- Jensen, A. R. (1981). Raising the IQ: The Ramey and Haskins study. *Intelligence*, 5(1), 29-40.
- Jensen, A. R. (1989). The relationship between learning and intelligence. *Learning and Individual Differences*, 1(1), 37-62.
- Jez, S. J., & Wassmer, R. W. (2013). *The impact of learning time on academic achievement*. California State University, Sacramento, Education and Urban Society.
- Joe, S., Joe, E., & Rowley, L. L. (2009). Consequences of Physical Health and Mental Illness Risks for Academic Achievement in Grades K-12. *Review of Research in Education*, 33(1), 283-309.
- King, A. (1990). Enhancing peer interaction and learning in the classroom through reciprocal questioning. *American Educational Research Journal*, 27(4), 664-687.
- Kovačević, I., Minović, M., Milovanović, M., De Pablos, P. O., & Starčević, D. (2013). Motivational aspects of different learning contexts: "My mom won't let me play this game...". *Computers in Human Behavior*, 29(2), 354-363.
- Kuan, P.-Y., & Yang, M.-L. (2004). *Educational achievement and family structure: Evidence from two cohorts of adolescents in Taiwan*. Paper presented at the Meeting on Social Stratification, Mobility, and Exclusion, the Research Committee on Social Stratification and Mobility (RC28), International Sociological Association. Neuchatel, Switzerland.
- Kukemelk, H., Lillemaa, T., & Tondi, J. (2011). Teachers' professional involvement in creating a general learning environment in Estonian schools. *Procedia-Social and Behavioral Sciences*, 11, 47-51.
- Lê-Scherban, F., Roux, A. V. D., Li, Y., & Morgenstern, H. (2014). Associations of Grandparental Schooling With Adult Grandchildren's Health Status, Smoking, and Obesity. *American journal of epidemiology*, 180(5), 469-481.
- Lamborn, S. D., Mounts, N. S., Steinberg, L., & Dornbusch, S. M. (1991). Patterns of competence and adjustment among adolescents from authoritative, authoritarian, indulgent, and neglectful families. *Child Development*, 62(5), 1049-1065.
- McFadden, K., & Dart, J. (1992). Time management skills of undergraduate business students. *Journal of Education for Business*, 68(2), 84-88.
- Metzler, J., & Woessmann, L. (2012). The impact of teacher subject knowledge on student achievement: Evidence from within-teacher within-student variation. *Journal of Development Economics*, 99(2), 486-496.
- Milevsky, A., Schlechter, M., Netter, S., & Keehn, D. (2007). Maternal and paternal parenting styles in adolescents: Associations with self-esteem, depression and life-satisfaction. *Journal of Child and Family Studies*, 16(1), 39-47.
- Moller, S., Stearns, E., Blau, J. R., & Land, K. C. (2006). Smooth and rough roads to academic achievement: Retention and race/class disparities in high school. *Social Science Research*, 35(1), 157-180.
- Moss-Racusin, C. A., Dovidio, J. F., Brescoll, V. L., Graham, M. J., & Handelsman, J. (2012). Science faculty's subtle gender biases favor male students. *Proceedings of the National Academy of Sciences*, 109(41), 16474-16479.
- Nonis, S. A., & Hudson, G. I. (2006). Academic performance of college students: Influence of time spent studying and working. *Journal of Education for Business*, 81(3), 151-159.
- Ojimba, D. P. (2013). Socio-economic status of parents and senior secondary school students' achievement in Mathematics in rivers state. *Nigeria Academic Research International*, 4(3), 484-491.
- Papaioannou, A. G., Ampatzoglou, G., Kalogiannis, P., & Sagovits, A. (2008). Social agents, achievement goals, satisfaction and academic achievement in youth sport. *Psychology of Sport and Exercise*, 9(2), 122-141.
- Ross, J. A. (1998). The antecedents and consequences of teacher efficacy. *Advances in research on teaching*, 7, 49-74.
- Ross, J. A., Hogaboam-Gray, A., & Hannay, L. (2001). Effects of teacher efficacy on computer skills and computer cognitions of Canadian students in grades K-3. *The Elementary School Journal*, 141-156.
- Rost, D. H., Sparfeldt, J. R., Dickhäuser, O., & Schilling, S. R. (2005). Dimensional comparisons in subject-specific academic self-concepts and achievements: A quasi-experimental approach. *Learning and Instruction*, 15(6), 557-570.
- Sadker, D. (1999). Gender Equity: Still Knocking at the Classroom Door. *Educational Leadership*, 56(7), 22-26.
- Sedlacek, W. E., & Sheu, H.-B. (2004). *Academic success of Gates millennium scholars. Readings on Equal Education*, 20(1), 181-197.
- Shah, M., Atta, A., Qureshi, M. I., & Shah, H. (2012). Impact of Socio Economic Status (SES) of Family on the Academic Achievements of Student. *Gomal University Journal of Research*, 28(1), 12-17.
- Shimada, K. (2010). Student achievement and social stratification: A case of primary education in Kenya. *Africa Educational Research Journal*, 1, 92-109.
- Wang, N., Johnson, W. L., Mayer, R. E., Rizzo, P., Shaw, E., & Collins, H. (2008). The politeness effect: Pedagogical agents and learning outcomes. *International Journal of Human-Computer Studies*, 66(2), 98-112.
- Watten, R. G., & Watten, V. P. (2013). Academic achievements among adolescent school children. Effects of gender and season of birth. *European Journal of Education and Psychology*, 5(2), 149-160.
- Wittmaier, B. C. (1972). Test anxiety and study habits. *The Journal of Educational Research*, 352-354.