Factors Having Impact on the Performance of Business Students

Case study of Institute of Business and Information Technology (IBIT)
University of the Punjab, Lahore, Pakistan

Sarwar, Aamir
Assistant Professor
Institute of Business and Information Technology (IBIT)
University of the Punjab, Lahore

Sarwar, S. M.
Professor and Director
Institute of Business and Information Technology (IBIT)
University of the Punjab, Lahore

Abstract

The aim of the study was to investigate the relations between the background information of the graduates of Institute of Business and Information Technology, University of the Punjab, Lahore, Pakistan, and their academic performance in terms of their graduation CGPA. The outcome of the analyses revealed that CGPA of the graduates is affected by session, previous academic record, and gender of the student. Results revealed that day scholars and students specializing in Finance earned better graduation CGPA. Results also show that a positive relationship between the variables Batch, Gender, Inter marks, and Matric marks, almost ranging from 25 % to 33%. Regression analysis showed overall only 20% variance in CGPA was because of the factors considered in this study.

Keywords: Terminology: BBIT, CGPA, GPA, HEC, IBIT, MBIT

1. Introduction

Determining the factors that influence students' performance is not a trivial matter. It may depend on multiple factors, including socio-economic-behavioral background of students, their family structure and family environment, personal attitude of a student towards his/her studies, level of stress in family or in educational institution, peer pressure, family support financial as well as in studies, teachers level of teaching, environment of the institute where he/she has been studying, previous schooling, regularity in attending classes, daily time spent on studies, overall disciplinary environment/pressure/restrictions in family or in educational institution, living with family (day scholar) or living in a hostel, educational background of the student (i.e., what sort of institution he or she has been to before joining university for higher education), what kind of courses he or she has already studied before undertaking business studies, student's time consumed in extracurricular activities, lack of preparation for a particular exam, student's working habits and commitment for studies, self motivation and level of healthy competition in class room among the students, gender of the student, father's profession and income level, parents' education, parental pressure, locality where they live, whether they belong to a main city or a small town, etc.

However, we have chosen the variables including educational background and performance of the student, previous schooling (government institution or private institution), gender, living with family (Day Scholar) or living in Hostel, father's income, education and profession, location (resident of metropoilitan city or small town), session (morning and afternoon), area of specialization in business studies, and courses studied before joining business school. These factors are more relevant to our local social setup and will make possible for our study to provide some policy guidelines where students' performance may be improved by making some changes in different controllable factors.

1.1. University of the Punjab

University of the Punjab is the oldest and largest institution of higher learning in Pakistan with a student population of over 30,000 and more than 1000 full-time faculty members.

The university has 14 faculties, 10 constituent colleges, and 71 departments, centers, institutes, and schools, offering 39 4-year Bachelor degree programs, 72, 2-year MA/MSc (Master) degree programs, 54 MS/MPhil degree programs, and PhD in 43 subject areas, from Physics to Microbiology and Molecular Genetics and from Business Administration to Punjabi Language. Student population of the 4-year degree programs makes 45.95% of the total student strength in the university. Overall, the male-to-female ratio in the student body is 50.47% to 49.53%. The same ratio in the 4-year degree programs currently stands at 56.34% to 43.66%. This ratio currently stands at 60.74% to 39.26% in the full-time teaching community.

1.2. Institute of Business and Information Technology (IBIT)

Established in 2001, IBIT is part of Faculty of Economics and Management Sciences (EMS). EMS consists of five academic units: Department of Economics, Department of Library and Information Sciences, Institute of Administrative Sciences (IAS), Institute of Business Administration (IBA), and IBIT. This faculty has a student population of 3586, with male-to-female ratios of 47% to 53% in its student body and 51% to 49% in its full-time teaching community. IBIT offers two degree programs, Bachelor of Business and IT (BBIT) and MBIT (after BBIT). The institute has 796 students with male-to-female ratio of 37.69 % (300) to 62.31 % (496).

1.3. Admission Criteria for the 4-year BBIT Program at IBIT

Matric and Intermediate marks are the only two factors considered while admitting students in the BBIT program at IBIT. Therefore, both these marks are also important while finding out any relation between the entry level and final CGPA of a student at the time of his/her graduation, also known as his/her graduation CGPA. The admission merit is calculated by using a linear expression involving a candidate's previous academic achievements, with most recent academic achievement given more than 80% weight. The merit formula is as follows.
Let, A and B be defined as

A = $1/4^{th}$ of the Marks Obtained in Matric + Marks Obtained in Intermediate
B = $1/4^{th}$ of the Total Matric Marks + Total Marks of Intermediate
Merit = (A / B) * 100

Based on the formula the merit list is prepared for all the candidates who apply for admission. On the basis of Merit list student who are on top of the list and also willing to get admission in the 4-year BBIT program are admitted. Total number of students admitted in Morning and Afternoon sections will depend on the number of seats approved for each department/institution/college by the Main Admission Committee of the Punjab University.

For Admission in the BBIT program students having at least 50 % marks in Intermediate (or equivalent qualification) are eligible to apply. There is no restriction on the subjects studied in Intermediate. Students with any combination of subjects are eligible for admission including pre-medical, pre-engineering, commerce, IT, Humanities (Arts subjects), General Science, and Technical Diploma from Punjab Technical Board.

1.4. Curriculum for the BBIT Program

During their BBIT studies students complete 130 credit hours, with primary focus on business education and a strong component of IT subjects. The curriculum offers four specializations: Marketing, Finance, IT, and Human Resource Management. However, students of the first six batches opted only for Marketing and Finance specializations. Students take eight specialization courses, offered in pairs of two each semester during the final four semesters of the degree program. Table-1 gives the high-level breakup of the BBIT curriculum:

2. Literature Review

Determinants of students' performance have been the subject of ongoing debate among educators, academics, and policy makers. According to the (Norhidayah Ali, 2009) university graduates are responsible for a country's economic and social development. Therefore, performance of students in universities should be a concern not only to the administrators and educators, but also to corporations in the labor market. CGPA is one of the main factors considered by the employers while recruiting workers, especially fresh graduates.

Thus, students have to place the greatest effort in their studies in order to score good grades in order to fulfill an employer's basic requirement for recruitment. Few earlier studies have shown the impact of different factors on a student's CGPA, including family support, quality, and efforts of teachers, and student's self-profile.

According to (Diaz, 2003), the academic performance of a student depends on many factors with three factors, family, teacher, and personal profile of students being the most critical. (Schulz, 2005), says that a student's family can contribute in many ways towards his/her academic performance. For instance, family can provide financial, moral, and other necessary and useful support to a student.

Literature provides a number of reports, which have successfully developed an association between performance of students and the role of different factors. The most common factors are family, teacher, school environment, and personal profile of the students as concluded by ((Diaz, 2003)**;** (Hijaz, (2006)).

Other studies such as (Xu, 2006) have discussed the combined effort of teachers and parents in the learning process and concluded that one of the behavioral aspects of teaching, teacher efforts in building and maintaining a strong teacher–parent partnership, is found to have significant impact on improving early childhood student performance. The objectives of the study by (Stella K. Kantartzi, 2010) were to analyze the effects of the factors (absences, class time, gender, class difficulty, and semester) on college students' performance in three science classes: Principles of Biology, General Botany, and Microbiology and Immunology over a period of three years.

According to a study organized by (CIM, KFUPM, 2004), family may have a positive and/or a negative impact on students' motivation (i.e., desire to study). However, students tend to attribute their success, firstly, to their self-desire (internal factors) and then to their family support and encouragement. The family financial support, encouragement and following up have positive impact on students' performance as measured by their CGPA. Saudi fathers' impact was more evident than that of Saudi mothers' because the former have higher education than the latter. This study only takes into account one factor that is motivation by the family for study or for higher CGPA. Consequently, the students' motivation (desire) was in reality influenced by internal and external factors. These factors are mainly: self-desire parents' impact, tribe's impact, university's academic policy, and teaching methods.

Many studies have been developed concerning the factors, including such as demographic, active learning, student attendance, extracurricular activities, and peers influence and course assessment, that influence a student's academic performance. Studies have shown that demographic characteristics can influence academic excellence. (Nasri and Ahmed, 2007) in their study on business students' (national students and non-national students) in the United Arab Emirates (UAE) indicate that non-national students who had higher grade point average were more competent in English, as reflected by their higher average for high school English.

There have been studies in the literature to identify the factors that have impact on the student's success in higher education. According to (Harb, 2007), determinants of students' performance have been the subject of ongoing debateamong educators, academics, and policy makers. There have been many studies that sought to examine this issue and their findings point out to hard work, previous schooling, parents' education, family income, and self motivation as factors that have a significant effect on a student's GPA. Most of the studies have focused on students' performance in the U.S. and Europe. However, since cultural differences may play a role in shaping the factors that affect students' academic performance, it is very important to examine those relevant factors in a non-US and non-European society.
Results of the study by (Harb, 2007) show that the most important factor that affects a student's performance in the UAE is student's competence in English. Besides their competence in English, students who participate in class discussions outperform other students. The factors that negatively affect a student's performance the most are missing too many lectures and living in crowded households. The results also show that non-national students outperform national students and female students outperform their male counterparts.

According to the study conducted by (Umar, 2010), social factors such as romantic relationships, organizations and clubs, and sports activities have been found to have negative effects on students' academic performance. These social factors affect academic performance in terms of time demanded and the psychological state they may cause.

According to the study by (Suttor, 2010), some of the factors that can impact academic success in high school include determination, work ethic, home life, attendance, accepting constructive criticism, social skills, and indulging in adult or illegal activities. While there are many factors in the academic success of a student, the most important is the positive and academically challenging attitude of the student towards his education.

The study conducted by (Adel Ben Youssef (Ph.D), 2008) examined the relationship between the use of information and communication technologies (ICT) and student performance in higher education. So far, economic research has failed to provide a clear consensus on the effect of ICT investments on a student's achievement.

The study by (Syed Tahir Hijazi, 2006) describes the factors having impact on the performance of students of private colleges in Intermediate examination. The factors considered for the study included students' attitude towards attendance in classes, time allocation for studies, parents' level of income, mother's age, and mother's education.

According to (Al-Mutairi, May 2011), determinants of students' performance have received considerable attention in the education literature and continue to be a challenge theme. Student performance is generally viewed as a product of socio-economic, psychological, and environmental factors. Hence, the factors are expected to vary from one country to another. Hence, the attempt was made in the literature is to identify the factors that affect students' performance and lead to student's success. (Al-Mutairi, May 2011), further describes that empirical studies in traditional learning of determinants of students' performance have pointed to issues such as student's aptitude, class attendance, gender differences, study effort, instructor's teaching style, computer experience, academic environment, and service received.

According to the study conducted by (Cumhur Erdem, 2007), factors such as the type of high school graduates, gender, the number of sisters/brothers in school, education level of parents, expression of family expectations about the school and study time have impact on the grade point average of a student.

The study by (Rafidah, 2009) examines the relationship between stress factors (health, social, and academic) and the level of perceived stress at three different periods of a semester (beginning, middle and end), and their impact on the academic performance of Pre-Diploma Science students at the University of Technology MARA (UiTM), Malaysia. The results indicate that on overall students experienced moderate level of stress and that none of the stress factors significantly affect the academic performance of students. There is a significant difference in the level of perceived stress between the beginning and middle of the semester but not significant between the middle and end of the semester. With regards to academic performance, there is no significant correlation in the level of perceived stress at both the beginning and middle of the semester.

The study by (Cumhur Erdem, 2007), determined the socio-economic and demographic factors that have impact on students' CGPA at Gaziosmanpaşa University, Turkey. The study found that factors such as the type of high school graduates, gender, the number of sisters/brothers in school, education level of parents, and expression of family expectations about the school and study time have impact on a student's CGPA.

3. Objectives of the Study

The high-level purpose of our study was to identify the factors that influence the performance of the students of 4-year BBIT degree program at IBIT, University of the Punjab. The detailed objectives of this study were:

1. To quantify the relationship between the different factors which are considered responsible for affecting students' performance and providing a base for further research in this area
2. To find out the relationship between different factors and student performance measured in terms of the CGPA of the student
3. To find out which of the factors have more impact on a student's performance To measure the change in the performance of students once they enter the university level, from annual system of learning and examinations to the semester system
4. To assess the change in the perception of students about the contribution of family and teachers
5. To describe the relationship between students' grades in intermediate and their academic performance during their BBIT studies, measured in terms of their CGPAs

6. To determine whether a linear combination of university admission criteria and/or learning style could predict students' academic performance, as measured by their CGPA
7. To determine whether a linear combination of university admission criteria and/or learning style could predict students' degree completion

4. Methodology

The performance of undergraduate students in this study is measured by their graduation CGPA, i.e., their CGPA at the end of their final semester of their degree program. In this study, the students' demographic profile, entry qualifications, and the subjects taken by the students in pre-university level education are also used as the predictor variables for students' performance in their degree program. The study considered different factors which can have an impact on the performance of students. The study tried to find out the relationship between these factors and students' graduation CGPA. The results of our study are unbiased and quite reliable because they are based on the analyses of actual data of over 500 students belonging to seven different batches, from 2001 to 2007.

Our research uses such factors in students' background, which can have an impact on their performance in their BBIT studies. We considered factors including marks in Matric (Secondary School Examination), marks in Intermediate or equivalent studies (12 years of education), college for Intermediate education, was the college government or private institution, board that conducted the Intermediate exams, subjects studied in Intermediate, student gender, home town of the student, whether the student is a day scholar or boarder, area of specialization in BBIT (Marketing or Finance), and occupation of the father (or guardian) or family background. When we say family background, in our study it means type of profession student's parents have, like a professional including doctor, lawyer, or consultant, businessman, agriculturists, government servant, or private service. All these different type of family backgrounds usually reflect different levels of education, financial strength, confidence, and exposure in students and a typical mindset of different sections in our society. Their outlook about their kid's education is different and sort of support they can provide will be different and can have different impact on students' academic performance.

The methodology used in the study is the longitudinal progress of students of seven batches, who were admitted and graduated from IBIT. Data collected is secondary and real.

4.1. Data Source

Data source is the data bank for the students and graduates of IBIT since its birth in 2001. The data set for this study was constructed from the manual and computerized student records of Institute's database. Most of the pre-university academic and personal information is provided by the students at the time of their admission to IBIT. Their detailed, semesterwise academic performance at IBIT is available in a computer database and is maintained even after a student has graduated.

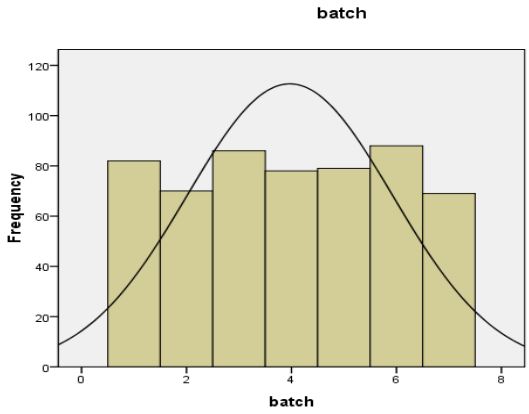
4.2 Data Measurement

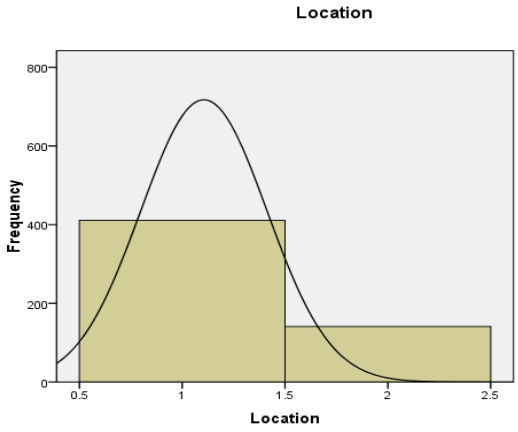
Like all institutions running semester systems, IBIT uses student GPA and CGPA to reflect their course, semester, and overall graduation-time performance. Pre-university performance in Matirc and Intermediate examinations are evaluated on annual basis and grades are given in form in percentage marks obtained in each course and overall percentage in the exams.

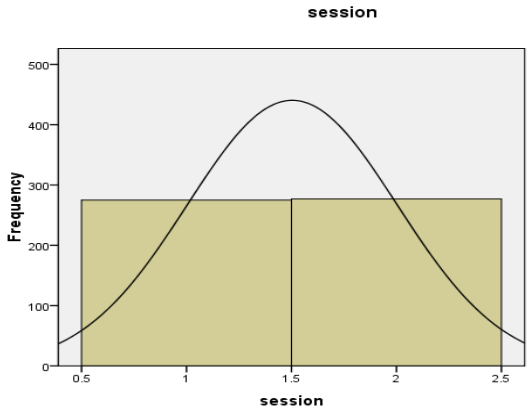
Table-2 shows detailed statistics about the secondary data used in our study. We will use this data to find out whether there is any relationship between the various factors given in the table and a student's performance in his/her BBIT degree in the form of his/her final CGPA.

4.3 Data Analysis

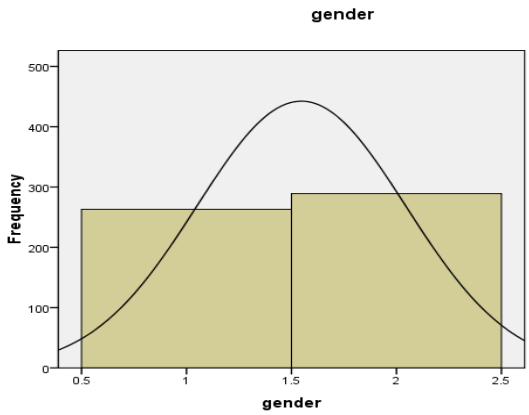
We used SPSS v17.0 for the entry and analysis of our data and to test our hypotheses and get the frequencies and several other statistical measures. Before applying any statistical tests we checked the normality of our data. The following are the histograms with normality curves for the various factors listed in Table-2.

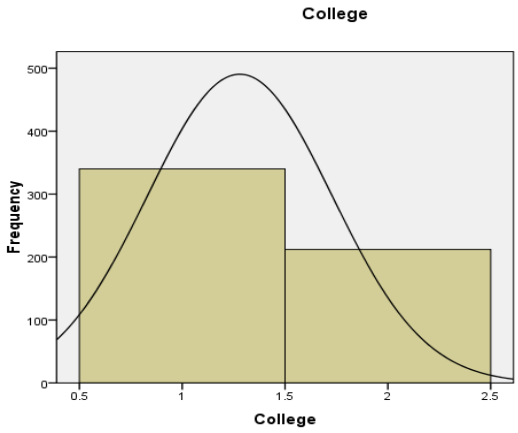

batch
Frequency
batch

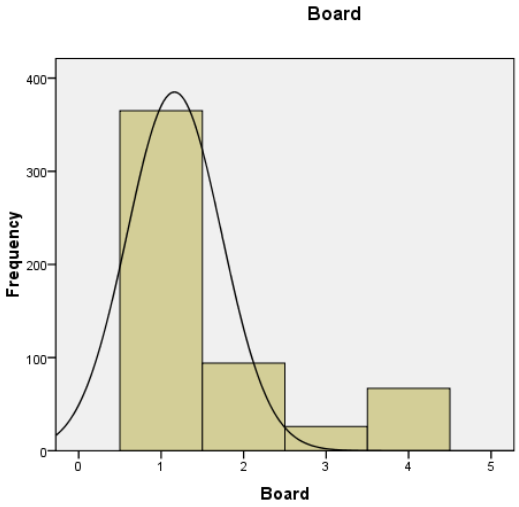

Location
Frequency
Location

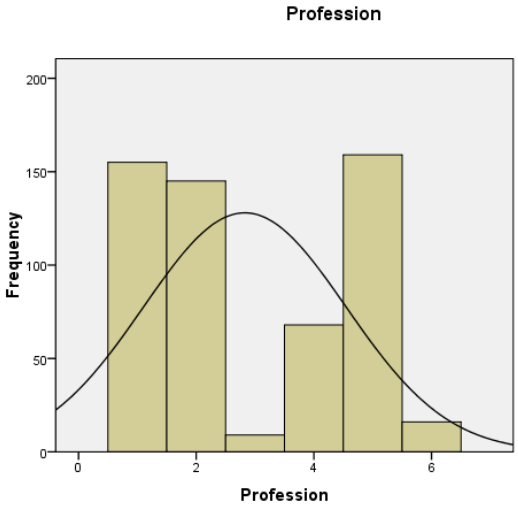

session
Frequency
session

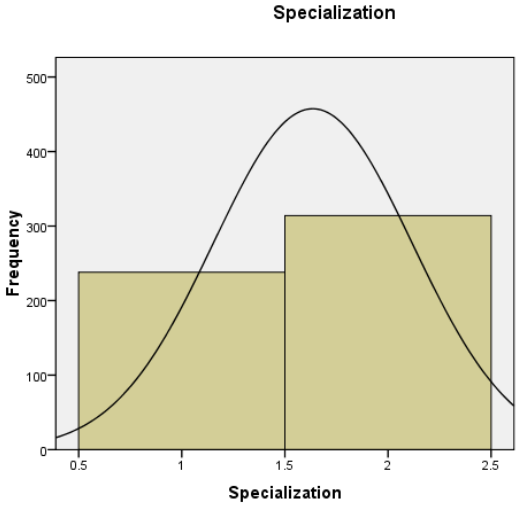

Courses
Frequency
Courses


gender
Frequency
gender


College
Frequency
College







From the normality curves, it is clear that the variables Batch, Session, Course, Inter Marks, and Matric Marks are perfectly normal. However, the variables Specialization, Board, Profession, Gender, Location, and College are not normal.
We performed the following tests on our data:

1. T-Test
2. ANOVA Test
3. Kruskal Wallis Test
4. Mann-Whitney U Test
5. Correlation
6. Regression Analysis

The purpose of performing these tests was to see what factors impacted the graduation CGPAs of the students of the given seven batches and the level of impact of each factor, or a group of factors, in this regard. So, graduation CGPA is our test (i.e., dependent) variable. The independent variables are all the factors listed as factor in the first column of Table-2. These variables belong to two classes: one having two levels (i.e., Session, Gender, Location, College, and Specialization) and second having three or more levels (i.e., Courses, Board, and Profession), accordingly, we apply relevant tests on one or more of these variables and the dependent variable (i.e., graduation CGPA of students).

4.4. Hypotheses

Our hypotheses are listed in Table-3.
We now describe the results of the various tests that we performed on our data and our analyses of these results, including which of our hypotheses are accepted and which are rejected.

5. Results of the Study

5.1. T-Test

The T test was applied on only the grouping variable Session and the test variable CGPA. Table-4 shows results of the test. Table-4 shows that in case of the grouping variable Session p-value is less than alpha, i.e. ,0.042 < 0.05. So we reject the H1. Therefore, we can say that the difference between the CGPA of the students of Morning and Evening session is not zero.

This means that CGPA of a student is affected by the session in which he/she is studying. Further, looking at their means we come to know that on average morning students secured higher CGPA as compared to the evening students of the same batch.

From the above stated parametric T test, we can conclude that the factor Session of a student, i.e., the session in which he/she had studied, played a role in the graduation CGPA of the student obtained. Now we need to find out the level of variation in CGPA that this variable creates and for this we will apply the co-relation test on these to variables. We will discuss this later in the paper.

5.2. ANOVA Test

We applied the ANOVA test on the dependent variable CGPA and independent variables Batch, Matric Marks, Inter Marks, and Courses studied. Table-5 shows results of this test.

Table-5 shows that p-value for the grouping variables Batch (p-value=0.072) and Course (p-value=0.077) are not less than alpha (i.e., 0.05). So we accept H2 and H3. Thus we can say that the difference between the CGPA of the students of Fall 2001 to Fall 2007 batches is zero. This means that the CGPA of a student was not affected by the batch in which he/she studied. We can also say that the difference between the CGPA of the students who studied the courses General Science, Pre-Medical, Pre-Engineering, Commerce, A Level, and Others is Zero. This means that CGPA of a student was not affected by the courses which he/she had studied prior to his/her admission in the BBIT degree program at IBIT.

Table-5 also shows that p-vlaue for the grouping variables Matric Marks (p-value=0.000) and Inter Marks are less than alpha. So we reject H4 and H5. Thus, we can say that the difference between the CGPAs of the students having different categories of Matric Marks is not zero. This means that CGPA of a student was affected by the marks obtained by the student in Matric. We can also say that the difference between the CGPAs of the students having different categories of Inter Marks is not zero. This means that CGPA of a student was affected by the marks obtained by a student in Inter.

So from the above stated parametric test, ANOVA, we can conclude that the factors courses studied by the student during his/her higher secondary education and marks obtained by the student in his/her Intermediate and Metric examinations play a vital role in his/her academic performance during the BBIT studies, i.e., obtaining good graduation CGPA. However, the only factor Batch of the student does not play as such any role in the CGPA obtained by the student. Again need is to see in detail the correlation between these factors and the main factor, i.e., CGPA. We performed some tests in this regard, including Factor Analysis in order to highlight the main factors affecting student's graduation CGPA.

5.3. Kruskal Wallis Test

Table-6 shows the results of applying the non-parametric Kruskal Wallis Test on the independent variables Board and Father's Profession against the dependent (test) variable graduation CGPA.

Table-6 shows that p-value for the grouping variables Board (p-value=0.068) and Profession (p-value=0.191) are not less than alpha (0.05). So we accept H6 and H7. Thus, we can say that the difference between the CGPA of the students of Board Lahore, Federal, IBCC and Others is zero. This means that CGPA of a student was not affected by the board under which he/she had studied for his/her Intermediate studies. Also, the difference between the CGPAs of the students having their Fathers' professions as Government employees, Private employees, working Abroad, Professional, Business, and Agriculturist is zero. This means that CGPA of a student was not affected by the profession of his/her father.

From the above analysis, we conclude that the board under which a student had studied for his/her Intermediate education and his/her father's profession did not play a vital role in the student's graduation CGPA.

5.4. Mann-Whitney U Test

Table-7 shows the results of apply Man Whitney U Test on Gender, Location, College, and Specialization against the dependent (test) variable CGPA.

Table-7 shows that in case of the grouping variable Gender versus Matric Marks, Inter Marks, and CGPA p-value are less than alpha, i.e., 0.000 < 0.05. So we will reject H8, H9, and H10.This means that the differences between Matric marks, Inter marks, and CGPA of the male and female students are not zero. This means ~~their~~ there might be a category of students who secure more marks in Matric either male or female. Furthermore, after reviewing the mean Matric marks, Inter marks, and CGPAs for the grouping variable Gender reveals that female students secured more Matric marks, Inter marks, and CGPA as compared to the male students.

Table-7 also shows that in case of the grouping variable Location versus Matric Marks (p-values=0.140) and Inter Marks (p-value=0.170), p-value are greater than alpha. So we accept hypotheses H11 and H12. This means that the differences between the Matric marks of the day scholars and boarders is zero. The same is true for the Intermediate marks of the day scholars and boarders. This means that the Location variable doesn't play any significant role in a student's marks in the Matric and Inter examinations. However, in case of the grouping variable Gender versus the test variable CGPA p-value is less than alpha, i.e., 0.012 < 0.05. Thus, we reject the H13. This means that the difference between the graduation CGPA of day scholars and boarders is not zero. This means ~~their~~ there might be a category of students who secure higher CGPA. Furthermore, review of the mean values in Table-8 reveals that day scholars secure higher CGPA compared to boarders.

Table-7 show that in case of the grouping variable Specialization versus Matric Marks (p-value=0.838) and Inter Marks (p-value=0.522) separately, p-value is greater than alpha in both cases. So we accept hypotheses H14 and H15. This means that the difference between the Matric marks or Inter Marks of the students having specialization in Finance or Marketing is zero. Table-7 shows that in case of the grouping variable Specialization versus the test variable CGPA p-value is less than alpha, i.e., 0.000 < 0.05. So we reject H16. In other words, the difference between the CGPA of the students having specialization in Finance or Marketing is not zero. This means there might be a category of students with either specialization who secure higher CGPA that the group with other specialization. Review of the mean values in Table-7 reveals that graduates with Finance specialization secure higher CGPA than those with the Marketing specialization.

Finally, Table-7 shows that in case of the grouping variable College versus Inter Marks p-value is 0.282, which is greater than alpha. So we accept H17. This means that the difference between the Inter marks of students who studied in Government (Public) or Private colleges is zero. However, in case of the grouping variable College versus CGPA p-value is less than alpha, i.e., 0.014 < 0.05. So we reject H18. In other words, the difference between the graduation CGPAs of the students who had studied in government colleges and those who had studied in private colleges is not zero. Furthermore, review of the mean values in Table-7 reveals that those students who had studied in government (public) colleges attained higher graduation CGPA than those who had studied in private colleges

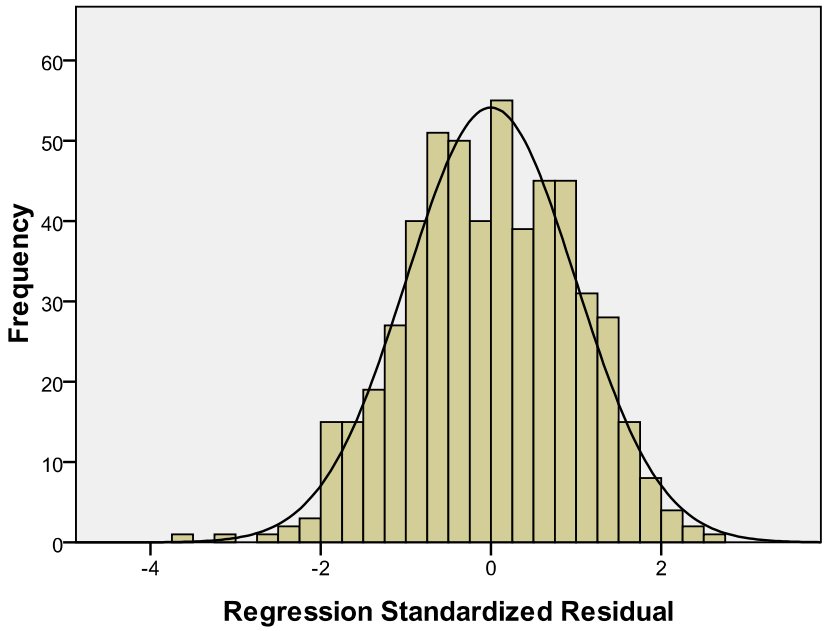
5.5. Correlation

In order to find out the factors which affect the CGPA the most, we ran the correlation test on them. The results of this test are shown in Table-8. Table-8 shows that in case of the variables Batch, Gender, Matric Marks, Inter Marks, Specialization, Session, Location, College, and Board versus CGPA, p-value are 0.000 and less than alpha, i.e., 0.000 < 0.05. So we reject hypotheses H19, H20, H21, H22, H24, H25, H26, H27, and H28. In other words, Pearson Correlation shows that there is a relationship between the graduation CGPA and these grouping variables. Table-9 shows the level of this correlation.

Table-8 also shows that in case of the grouping variable Courses versus CGPA, p-value (0.495) is less than alpha. Similarly, in case of the grouping variable Profession versus CGPA, p-value (0.908) is also less than alpha. Therefore, we accept hypotheses H23 and H29. This means that there are no relationships between the grouping variables Courses and Profession with CGPA.

5.6. Regression Analysis

The following histogram and the associated curve show that the histogram is perfectly normal.



Regression analysis was used in order to test the hypothesis statements and to find out whether there is any relationship between the variables and whether this relationship is positive or negative.
Table-10 shows the model summary generated by SPSS.

From this summary generated by SPSS, we see that the value correlation is 0.464 and value of Adjusted R square (Coefficient of Determinations) is 0.19.9 * 100 = 19.9%.

A positive relation was found between CGPA and other parameters considered in this study, which meant that these parameters have a positive impact on the CGPA of a student. Furthermore, the value of correlation shows that this relationship is moderately positive. In Table-10, the value of Adjusted R-Square depicts that almost 20 % of the variance in the observed values of a student's graduation CGPA was due to the different parameters such as student's father's profession, marks obtained by the student in his/her Intermediate examination, whether the student studied in a government (public) or private college for his/her Intermediate studies, student's specialization in BBIT, courses studied for the Intermediate examination, student's board for Intermediate examination, student's gender, student's session, batch, marks obtained by the student in Matric examination, and student's hometown of student, whereas, 80 % variability was due to the other unexplained factors which were held constant.

6. Conclusions

Based on the results of the various statistical tests performed on the graduation CGPA of the students of two batches of the BBIT degree program against different parameters stated above, we can make the following conclusions:

1. From the parametric T-test, we conclude that the session in which a student studies plays an important role in the graduation CGPA of the student. Further, the tests had proved that the morning students secure higher graduation CGPAs as compared to the evening students.
2. From the ANOVA test we conclude that courses studied by the student in the college for his/her Intermediate examination and marks obtained by the student in the Intermediate and Matric examinations also plays a vital role in gaining good graduation CGPA. However, which batch (i.e., year) a student is admitted into the BBIT program does not play any role in student's graduation CGPA.
3. From the non-parametric ~~test i.e.~~ Kruskal Wallis test, we conclude~~d~~ that ~~the factors~~student's board for Intermediate examination and student's father's profession do~~es~~ not play a vital role ~~in gaining~~towards student's ~~good~~ graduation CGPA.

4. From the results of Man Whitney U Test, we conclude that female students secure better marks in Matric, Intermediate and in bachelors as compared to male students. Further, it was clear from the results of tests that day scholars get better graduation CGPA as compared to boarders. Also, student with finance major secure better graduation CGPA as compared to students who did their specializations in other fields.
5. The results of correlation test reveal that there is a positive, but little, relationship, ranging between about 18% to 33%, between a student's batch, gender, marks obtained in Intermediate and Matric examinations, and specialization (finance or otherwise) and a student's graduation CGPA. The strongest correlation, 33%, is between a student's marks in his/her Intermediate examination and his graduation CGPA. Regression Analysis show overall 20% variance in the graduation CGPA of a student is because of these factors. So we can say these factors positively contribute towards a student's graduation CGPA, although this bond is not very strong.

As far as IBIT is concerned, the findings of our research have reinforced that our belief that our admission criteria is well thought out because more than 80% weight is given to a applicant's marks in his/her Intermediate examination, a parameter which is has the highest correlation to the graduation CGPA of a graduate. We believe that these findings will help a university's management to make informed decisions on the entry requirements into their business programs with considerable IT component. These findings should be useful to the academic communities, the public and other stakeholders who are interested in improving students' performance.
Our study has shown that female students perform better than male students do. Considering the fact that male-to-female ratio at IBIT is 38:62 better academic performances of female graduates has serious socio-economic implications, positive and negative, in non-western society like Pakistan.

7. Future Research Directions

In future, we plan to extend our research as follows:

1. Extend the study to a few more batches of BBIT in order to have more confidence in our findings.
2. Identify Matric and/or Intermediate subjects that most positively correlate to the graduation CGPA of students and make appropriate adjustment in the BBIT admission criteria.
3. Extend the study to more 4-year degree programs in the university in order to be able to correlate a student's graduation CGPA with the various factors used in this study and be able to make more general conclusions about students' performance in the 4-year Bachelor degree programs,
4. Extend the study to MBIT and other related post-graduate degree programs at the university programs.

8. Acknowledgements

The authors would like to thank the Academic office of IBIT computer section for providing data submitted by students' at the time of admission and their academic performance, namely their semester results.

Table-1: High-level breakup of the 4-year BBIT degree curriculum

Subject Area	Credit Hours
Business	46
Information Technology	36
General Education (Social Sciences and Humanities)	24
Specialization	24
Total	**130**

Table-2: Detailed secondary student data used in the study

Factor		Fall 2001	Fall 2002	Fall 2003	Fall 2004	Fall 2005	Fall 2006	Fall 2007	Total
Session	Morning	43 (52.40)	37 (52.90)	44 (51.20)	37 (47.40)	38 (48.10)	42 (47.70)	34 (49.30)	275
	Afternoon	39 (47.60)	33 (47.40)	42 (48.80)	41 (52.60)	41 (59.90)	46 (52.30)	35 (50.70)	277
Gender	Male	53 (64.60)	36 (51.40)	43 (50.00)	32 (41.00)	38 (48.10)	35 (39.80)	26 (37.70)	263
	Female	29 (35.40)	34 (48.60)	43 (50.00)	46 (59.00)	41 (59.90)	53 (60.20)	43 (62.30)	289
Location	Lahore	51 (62.20)	50 (71.40)	65 (75.60)	65 (83.30)	62 (78.50)	68 (77.30)	50 (72.50)	411
	Others	31 (67.80)	20 (28.60)	21 (24.40)	13 (16.70)	17 (21.50)	20 (22.70)	19 (27.50)	141
Courses	Pre-medical	17 (20.70)	14 (20.00)	6 (07.00)	11 (14.10)	13 (16.50)	30 (34.10)	26 (37.70)	117
	Pre-Engineering	20 (24.40)	15 (21.40)	24 (27.90)	27 (34.60)	25 (31.60)	26 (29.50)	18 (26.10)	155
	Others	10 (12.20)	3 (4.30)	3 (03.50)	4 (05.10)	6 (07.60)	6 (06.80)	8 (11.60)	40
	General Science	32 (39.00)	32 (45.70)	45 (52.30)	31 (39.70)	30 (38.00)	26 (29.50)	17 (24.60)	213
	A level	3 (03.70)	6 (8.60)	8 (09.30)	5 (06.40)	5 (06.30)	0 (00.00)	0 (00.00)	27
College	Government	62 (75.60)	39 (55.70)	49 (57.00)	49 (62.80)	45 (57.00)	56 (63.60)	40 (58.00)	340
	Private	20 (24.40)	31 (44.30)	37 (43.00)	29 (37.20)	34 (43.00)	32 (36.40)	29 (42.00)	212
Board	Lahore	54 (65.90)	47 (67.10)	51 (59.30)	54 (69.20)	51 (64.60)	62 (70.50)	46 (66.70)	365
	Federal	10 (12.20)	14 (20.00)	19 (22.10)	12 (15.40)	15 (19.00)	15 (17.00)	9 (13.00)	94
	IBCC	2 (2.40)	4 (05.70)	8 (09.30)	5 (06.40)	5 (06.30)	1 (01.10)	1 (01.40)	26
	Others	16 (19.50)	5 (07.01)	8 (09.30)	7 (09.00)	8 (10.10)	10 (11.40)	13 (18.80)	67
Specialization	Marketing	26 (31.70)	34 (48.60)	44 (51.20)	27 (34.60)	33 (41.80)	44 (50.00)	30 (43.50)	238
	Finance	56 (68.30)	36 (51.40)	42 (48.80)	51 (65.40)	46 (58.20)	44 (50.00)	39 (56.50)	314
Profession	Government Employee	15 (18.30)	18 (25.70)	28 (32.60)	18 (23.120)	22 (27.80)	25 (28.40)	29 (42.00)	155
	Private Employee	30 (36.60)	17 (24.30)	20 (23.30)	19 (24.40)	25 (31.60)	22 (25.00)	12 (17.40)	145
	Abroad	3 (3.70)	0 (00.00)	1 (01.20)	11 (14.10)	2 (02.50)	3 (03.40)	0 (00.00)	20
	Professional	16 (19.50)	8 (11.40)	8 (09.30)	0 (00.00)	7 (08.90)	10 (11.40)	8 (11.60)	57
	Business	15 (18.30)	21 (30.00)	28 (32.60)	29 (37.20)	22 (27.80)	25 (28.40)	19 (27.50)	159
	Agriculturist	3 (3.70)	6 (08.60)	1 (01.20)	1 (01.30)	1 (01.30)	3 (03.40)	1 (01.40)	16
	GRAND TOTAL	82	70	86	78	79	88	69	552

Table-3: Our Hypotheses

Hypothesis	Statement
H1	Difference between the CGPA of the students of Session (Morning or Evening) is zero
H2	Difference between the CGPA of the students of Batches Fall 2001 to Fall 2007 is zero
H3	Difference between the CGPA of the students of different 12-year education Courses (General Science, Pre-Medical, Pre-Engineering, Commerce, A Level, and Others) is zero
H4	Difference between the CGPA of the students having different levels of Matric Marks is zero
H5	Difference between the CGPA of the students having different levels of Inter Marks is zero
H6	Difference between the CGPA of the students of Intermediate Board (Lahore, Federal, IBCC, and Others) is zero
H7	Difference between the CGPA of the students having their Father's profession (Government, Private, Abroad, Professional, Business, and Agriculturist) is zero
H8	Difference between the Matric marks of the Male and Female students is zero
H9	Difference between the Inter marks of the Male and Female students is zero
H10	Difference between the CGPA of the Male and Female students is zero
H11	Difference between the Matric marks of the day scholars and boarders is zero
H12	Difference between the Inter marks of the day scholars and boarders is zero
H13	Difference between the CGPA of the day scholars and boarders is zero
H14	Difference between the Matric marks of the students having specialization in finance or marketing is zero
H15	Difference between the Inter marks of the students having specialization in finance or marketing is zero
H16	Difference between the CGPA of the students having specialization in finance or marketing is zero
H17	Difference between the Inter marks of the students who studied in Government or Private colleges is zero
H18	Difference between the CGPA of the students studied in Government or Private colleges is zero
H19	There is no relationship between the variables Batch and CGPA
H20	There is no relationship between the variables Gender and CGPA
H21	There is no relationship between the variables Matric marks and CGPA
H22	There is no relationship between the variables Inter marks and CGPA
H23	There is no relationship between the variables Course and CGPA
H24	There is no relationship between the variables Specialization and CGPA
H25	There is no relationship between the variables Session and CGPA
H26	There is no relationship between the variables Location and CGPA
H27	There is no relationship between the variables College and CGPA
H28	There is no relationship between the variables Board and CGPA
H29	There is no relationship between the variable Profession and CGPA

Table-4: Results of T-Test on the grouping variable Session and the test variable CGPA

Test Variable	Grouping Variable	Mean		T-Test		
		Morning	Evening	T value	d.f.	P-value
CGPA	Session	3.2776	3.1677	3.586	550	0.042

Table-5: Results of ANOVA on Batch, Matric Marks, Inter Marks, and Courses Studied

Hypothesis	Test Variable	Grouping Variable	F value	P-value
H2	CGPA	Batch	2.162	0.072
H3	CGPA	Course	2.160	0.077
H4	CGPA	Matric Marks	9.304	0.000
H5	CGPA	Inter Marks	1.257	0.030

Table-6: Results of applying Kruskal Wallis Test on the independent variables Board and Father's Profession against the dependent (test) variable CGPA

Hypothesis	Test Variable	Grouping Variable	Chi square	d.f	P-value
H6	CGPA	Board	7.132	3	0.068
H7	CGPA	Profession	7.426	5	0.191

Table-7: Results of applying Man Whitney U Test on independent variables Gender, Location, ~~College,~~College and Specialization against the dependent (test) variable CGPA

Hypothesis	Test variable	Grouping Variable	Mean		P-Value
			Male	Female	
H8	Matric Marks	Gender	242.02	307.88	0.000
H9	Inter Marks		218.23	329.53	0.000
H10	CGPA		234.00	315.17	0.000
			Lahore	Others	
H11	Matric Marks	Location	268.33	300.30	0.140
H12	Inter Marks		271.05	292.39	0.170
H13	CGPA		286.49	247.38	0.012
			Marketing	Finance	
H14	Matric Marks	Specialization	278.09	275.29	0.838
H15	Inter Marks		271.51	280.29	0.522
H16	CGPA		242.17	302.52	0.000
			Government	Private	
H17	Inter Marks	College	282.27	267.33	0.282
H18	CGPA		289.68	255.37	0.014

Table-8: Pearson correlations between the different grouping variables and Graduation CGPA of a student

Hypothesis	1st Variable	2nd Variable	Correlation	Sigma
H19	Batch	CGPA	0.251	0.000
H20	Gender	CGPA	0.264	0.000
H21	Matric Marks	CGPA	0.226	0.000
H22	Inter Marks	CGPA	0.324	0.000
H23	Courses	CGPA	0.044	0.495
H24	Specialization	CGPA	0.177	0.000
H25	Session	CGPA	-0.151	0.000
H26	Location	CGPA	-0.119	0.005
H27	College	CGPA	-0.095	0.026
H28	Board	CGPA	-0.096	0.025
H29	Profession	CGPA	-0.005	0.908

Table-9: Percentage correlation between the ~~graduation~~Graduation CGPA of a student and different grouping variables

Grouping Variable	Correlation (%)	Relationship
Batch	25.1%	Direct
Gender	26.4%	Direct
Matric Marks	22.6%	Direct
Inter Marks	32.4%	Direct
Specialization	17.7%	Direct
Session	15.1%	Inverse
Location	11.9%	Inverse
College	9.5%	Inverse
Board	9.6%	Inverse

Table-10: Model Summary generated by SPSS

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.464	0.215	0.199	0.32577
Predictors: (Constant), Profession, Inter Marks, College, Specialization, Courses, Board, Gender, Session, Batch, Matric Marks, Location				

References

Adel Ben Youssef (Ph.D), M. D. (2008). The Impact of ICT on Student Performance in Higher Education: Direct effect, Indirect Effects and Organizational Change;The Economincs ogf E-learning, RUSC Vol. 5 n. 1 (2008), Retrieved from http://rusc.uoc.edu. *Te Economincs of E-learning* .

Al-Mutairi, A. (May 2011). Factors Affecting Business Students' Performance in Arab Open University: The Case of Kuwait. *The International Journal of Business and Management, Vol (6) No. 5* , 146-155.

CIM, KFUPM. (2004). Family Impact on Students' Motivation. *Second International Conference on Administrative Sciences Proceedings* (pp. 2-20). Jeddah: CIM, KFUPM.

Cumhur Erdem, I. S. (2007). Factors Affecting the Grade Point Average of University Students, The Empirical Economic Letters 6(5), September 2007, PP:359-368. *The Empirical Economic Letters 6(5)* , 359-368.

Cunninggham, I. H. (1996). Empowerment: The power to do what? *Industrial Relations Journal , Vol. 27, No. 2*, 143-155.

Deniz Rende, S. R. (2006). Factors Predicting the Performance of Engineering Students: A Case Study from Yeditepe University, 9th International Conference on Engineering Education, July 23-38, 2006., (pp. Session M4F-8).

Diaz, A. (2003). Personal, Family and Academic Factors affecting low Achievement in Secondary School. *Journal of research in Educational Psychology and Psycho pedagogy 1 (1)* , 43-66.

Harb, N. a.-S. (2007). Factors Affecting Students' Performance, Journal of Business Education 582 (2007), pp:282-290, Retrieved from http://www.mpra.ub.uni-muenchen.de/13621/ on July 25, 2011. *Journal of Business Education* , 282-290.

Hijaz, S. &. ((2006)). Factors Affecting Students' Performance: A Case of Private Colleges, . *Bangladesh e-Journal of Sociology, 391),* , 1-10.

Kriuskal-Wallis Nonparametric Comparison Tutorial. Retrieved On December 15, 2010 from Texasoft: http//www.texasoft.com/winkrus.html. (2008, June 16).

Lin, T.-C. (2010, May 12). *Absenteeism and Exam Performance: Evidence for Introductory Microeconomics, Retrieved from http://papers.ssrn.com/sol3/results.cfm?RequestTimeout=50000000 on July 23, 2011*. Retrieved July 23, 2011, from Social Science Research Network: http://papers.ssrn.com/sol3/results.cfm?RequestTimeout=50000000

Norhidayah Ali, K. J. (2009). The Factors Influencing Students' performance at Universiti Teknologi MARA Kedah, Malaysia. *Management Science and Engineering (ISSN 1913-0341) Vol.3 No.4* , 81-90.

Rafidah, K. A. (2009 , June). Impact of Perceived Stress and Stress Factors in Educational Performance of pre-Diploma Scinece Students: A Malaysian Study. *International Journal of Scientific Research in Education Vol 2(1)* , 13-26.

Schulz, W. (. (2005). Measuring theSocio-economic Backgroud of studnets and its effects on Achievement in PISA 2000 and PISA 2003. *presented at Annual Meetings of the American Educational Research Association.*

Stella K. Kantartzi, S. A. (2010). Study of Factors Affecting Students' Performance in three Science Classes: General Biology, Botany, and Microbiology at Fayetteville State University. *KBM Journal of Science Education 1(1)* , pp. 13-18.

Suttor, M. (2010). Factors that impact academic success in high school, Retrieved from http://www.helium.com/items/1952447-academic-success on July 22, 2011 .

Syed Tahir Hijazi, S. M. (2006). FACTORS AFFECTING STUDENTS' PERFORMANCE: A Case of Private Colleges. *Bangladesh e-Journal of Sociology. Volume 3. Number 1. January 2006. retrieved From http://www.scribd.com/doc/5486916/FACTORS-AFFECTING-STUDENTS-PERFORMANCE on July 26, 2011* , 1-10.

Taylor, M. W. (n.d.). A Study of Factors Influencing Student Performance in Mathematics on the Florida College-Level Academic Skills Test (CLAST), The Journal of Negro Education, Vol. 58, No., pp. 531-543, Retrieved from http://www.jstor.org/stable/2295210 on July 23, 2011. *The Journal of Negro Education* , 531-543.

Umar, S. S. (2010). The Effect of Social Factors and Students' Academic Perfromance in Nigerian Tertiary Institutions (March 2010), Library Philosophy and Practice, Retrieved from www.faqs.org/periodicals/201003/2025367111 on July 23, 2011.

Xu, Z. G. (2006). How does Teacher Quality Matters? The Effect of Teacher-Parent partnership on Early Childhood Performance in Public and Private Schools. *Education |Economics, 14(3)* , 345-367.