

## Statistical Analysis of Constraints Acquiring Higher Secondary Education

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### Abstract

*The illiteracy rate in Pakistan is sky-scraping as compare to the other developed countries of the world. Being illiterate is not only a single person disability; it also has some social implications. It is very hard for the democratic institutions and values to prosper in a society where half of the adult population is uneducated, and most of the citizen cannot access information or read newspapers. The situation seems to be more critical when a large number of students drop their education in a mid-way because of some factors. Pakistan is one of the countries of the world in which the illiterate peoples are great in numbers. This study was conducted to examine these factors as well as the basic reasons which have some influence on the academic performance of the students belongs to higher secondary education especially in big cities of Pakistan like in Karachi. The respondents of this study were the students who are either currently involved in the pre-graduate studies i.e. Higher Secondary studies of part I and part II or have gone through this educational level most recently. A survey was conducted by using a questionnaire for information gathering about different factors relating to academic performance of students and dropouts. Percentage and different Hypothesis techniques were applied to analyze the data. The results of the study revealed that the “Poverty” and “Unawareness about the importance of education” collectively play a major role regarding the dropout rate of students during their pursuit for higher secondary education. Under the viewpoint of performance of the students, it was anticipated that “Cheating” and “Politics” jointly play a part for students’ progress towards higher secondary education in Karachi.*

**Keywords:** Literacy rate, effects on literacy, education constraints, Learning constraints, Higher Secondary education.

### Explanation of Index Terms:

**Dropout:** Person who leaves school/college before completing his/her education (Dictionary and UNESCO glossary). According to ministry of education dropout is withdrawal of children from school at any stage before completion of primary education.

According to Texas Educational Agency, A student is identified as a dropout if the individual is absent without an approved excuse or documented transfer and does not return to school by the fall of the following school year, or if he or she completes the school year but fails to reenroll the following school year.

**Primary Schools:** *All the educational institutions providing education to the students of class I to V (aged 5 -9).*

**Higher Secondary education:** *All the educational institutions providing education to the students of class eleven and twelve (aged 15 -17).*

**Government Schools:** *All the educational institutions run by provincial government of Sindh.*

**Karachi:** *City of Pakistan, provincial capital of the province of Sindh, administratively control by City District Government Karachi (CDGK).*

## 1. Introduction

Education is the necessary requirement for every human. It is also very essential for the progress of any country. Education is the responsibility of the government who should make every possible effort to provide it on an ever interesting and increasing extent in accordance with the national resources. According to Jusof, K. *et. al.*, [1] the students' academic achievements play a vital rule in forming the future of the country.

In this era of globalization and technological revolution, education is considered as a necessary step for every person's activity. It plays an essential role in the development of societies and is correlated with an individual's well-being and opportunities for better living. The linkage between the different levels of education such as, primary, middle and higher level education is evident. This bondage, whenever studied in terms of its effectiveness the role of primary/earlier years' education appears to be of very high impact over the subsequent years of higher education. In Pakistan there are a lot of factors that seem to have affected the gradient of higher education other than the earlier years of study. Memon in [2], claim that the quality of education in Pakistan is on the declination in spite of the fact that the government of that time had initiated drastic measures in uplifting the quality and quantity of education. Quality of teachers particularly at primary level is still questionable.

Education is one of the basic needs of the modern societies as the society made its foundation on the basis of education. The days are gone when nations with most manpower and greatest combatants were considered the best on the surface of earth. Today the education is the power to rule and to control the world and this is a known reality now. No nation can flourish and prosperous without education.

According to Kazmi *et. al.*, [3], the drop out was one of the major issue by which the educational programs, Education for All (EFA) & Millennium Development Goals (MDGs) suffer a lot.

Apart from the factors, that play very vital role to increase number of dropouts, there are also some reasons due to which the performance of the students greatly affected. Measuring of academic performance of students is challenging since student performance is product of socio-economic, psychological and environmental reasons. Educators, trainers, and researchers have long been interested in exploring variables contributing effectively for quality of performance of learners. These variables are inside and outside of the institution that affect students' quality of academic achievement.

This study aims at highlighting the constraints which directly affect the students to acquire higher secondary education, as well as the reasons of poor performance of the students in Pakistan. The higher secondary education as per the standards outlined by the Board of Intermediate Education Karachi, comprise of year 11 and 12 academic years. Higher

Secondary Education is commonly referred to as “Intermediate Studies” locally. The prerequisite for intermediate studies is Matriculation (Secondary level) or the O’ level studies. The respondents of this study were the students who are either currently involved in the intermediate studies i.e. year 11 or 12 or have gone through this educational level most recently and are studying currently in year 13 or 14 academic years in private or government universities and/ or the students who dropped out from higher studies.

## 2. Literature Review

Education is a primary human right and every child is rightful proprietor to it. It is very important to our development as individuals and as societies, to increase literacy rate which help us to get a successful and productive future. According to the report of Pakistan Education Statistics, in 2010-11 the total educational institutions in Pakistan are approximately 270,825 (0.27 million approx.) in which 40,926,661 (41 million approx.) students taking education with the help of 1,507,100 (1.5 million approx.) teachers. Out of (0.27 million) institutions, there are 194,151(1.94 million) public and 76,674(0.07 million) private institutions.

Pakistan is a nation where the higher-secondary drop-out is high. High dropout rates have been one of the major factors preventing the enhancement of the literacy rate Joubish *et. al.*, [5], mentioned some reasons of high dropout rate which are poverty, illiteracy among parents, deficiency of enthusiasm among children, learning problem, physical punishment, bad attitude and temperament of teachers, deficiency of co-curricular activities in schools for children, old and conventional way of teaching, environment of the school, and incompatible management. According to the report by Lynd in ‘*The Education System in Pakistan2007*’ [6], to improve the teaching environment, several schools are in a great need of better facilities. In [6] Lynd also pointed out that, 9% of the Pakistan’s primary schools which are associated with public sector do not have a blackboard (use to class room teaching for the students ) in it, 24% do not have any textbook available for their students and 46% are those which do not have sitting chairs/desks for their students. In comparison with public sector’s primary school, private primary schools are better organized with class room furniture. But generally ( $1/4^{th}$ ) of the primary school of in both public and private sector which do not have any textbooks. The drop-out analysis based on gender basis [20] indicated that the overall females receive less education than males in the country region of Pakistan. Generally the more girls tend to dropout, or withdrawn earlier due to economic and social-cultural reasons.

According to the finding of Ahmed *et. al.*, in [7], poor parents cannot send their children to private schools because of their financial condition. Parents will only choose private education sector if they think that the existing jobs need certain minimum educational qualifications (such as government jobs, overseas jobs and teaching). Bos *et. al.*, [8], and Rainey *at. al.*, in [9], found that parents’ educational level, concern and better socio-economic condition produce good impact on the quality of education for their children. Voorhis in [10] found somehow same result that was raised Bos *et. al.* in [8], as the students whose parents take interest in their studies attain good results and move further in their studies.

Tahir, S., & Naqvi, S. R. in [11], conducted a study in 2006 on students’ performance. They collected test data from the colleges located in Province Punjab of Pakistan by selecting the sample of 300 students in which 225 were males and 75 were females. He stated the hypothesis as “Student’s attitude towards attendance in class,

hour spent in study on daily basis after college, students' family income, students' mother's age and mother's education are significantly related with student performance.” They used simple linear regression analysis. They concluded that the education of a mother and financial condition of the student’s family are remarkably correlated with academic performance of the students. They also found that those students which belong to more affluent family do not give proper attention to their studies. It shows the unimportance of education among rich students.

Mushtaq in [12], conducted some research on “Factors Affecting Students’ Academic Performance” & found that one of the major causes of flawed education system in Pakistan is awareness and lack of counselling for education for both boys and girls. According to report generated in 2006 by Pakistan Education Census *i.e.*, [13] and National Education Policy of 2009 expressly [14], Pakistan has surprisingly failed to provide its citizens a satisfactory approach towards quality of education and training. In 2009 the literacy rate is around 54 % which is quite low and literacy growth at around 1.5 % annually emphasize the internal and external carelessness of the system.

Ahmed wrap up his working particularly [15], on the note that the primary schools network associated with public sector in Pakistan was unable to deliver encouraging results and the public authorities have to bring in private sector institutions under extremely ambitious atmosphere to get better quality and reduce costs.

For the betterment of students’ education, Pandey, U.K., & Pal, S., in [16], used data mining technique named as Bayes classification, on students’ database to predict the students’ results on the basis of previous year database. This study will help the institution to reduce the drop out proportion to a significant level and improve the performance level of the institution. According to [16] the study conducted was equally valid for categorically signifying the students in need of individual attention, in order to help in taking the right steps accordingly and to reduce the rate of failures.

Examination plays a decisive role in any student’s life. The marks obtained by the student in the examinations determine his future. Therefore it becomes fundamental for any teacher to predict whether the student will pass the examination or not. If the prediction says that a student may fail in the examination before the examination then the teachers/administration of the institution can make some extra efforts or pay some special attention to that student to improve his/her studies and help him/her to pass the examination.

Yadav, S. K., Bharadwaj, B., & Pal, S. in [17], apply different data mining technique named as Decision tree to obtain same goals as Pandey [16] and conclude that the algorithms of Decision tree can be applied on the data associated with students’ past results by which they can generate the model. That model can be used to forecast the students’ future performance. It helps earlier in identifying the dropouts and students who need special concentration and then teachers can give suitable advising/counselling.

Ellen [18] analyses the factors of primary education drop-out in Asia regions especially the countries where the primary education drop-out rate is highest such as, Peninsular Malaysia, India, China, Viet Nam, Sri-Lanka and Thailand. One major problem noted in the Unesco world survey [19] for the analysis of factors of primary drop-out is the availability of data in the region. Mike, I. O. *et. al.*, [21] also pointed out the socioeconomic factors of primary school dropout in Uganda. He used the aid of a logistic model analysis by considering the 2004 National Service Delivery Survey data. According to Mike the factors such as, insignificance of distance to school, pupil gender, role of household head and total average amount of school dues paid by pupil

are influences the dropout of pupils. He also indicated the significance of parental education, household size and proportion of economically active household members are impact the chances of pupil dropout.

### **3. Objectives of the Study**

The aim of the present study is to examine, contrast and compare some different socio-economic factors and their reason which affect Higher Secondary education system. The factors which were analysed are,

- Poverty.
- Teachers' Attitude.
- Unnecessary Restriction from Parents.
- Gender Discrimination.
- Bad Results.
- Lack of Interest in Studies.
- Unawareness about importance of education.

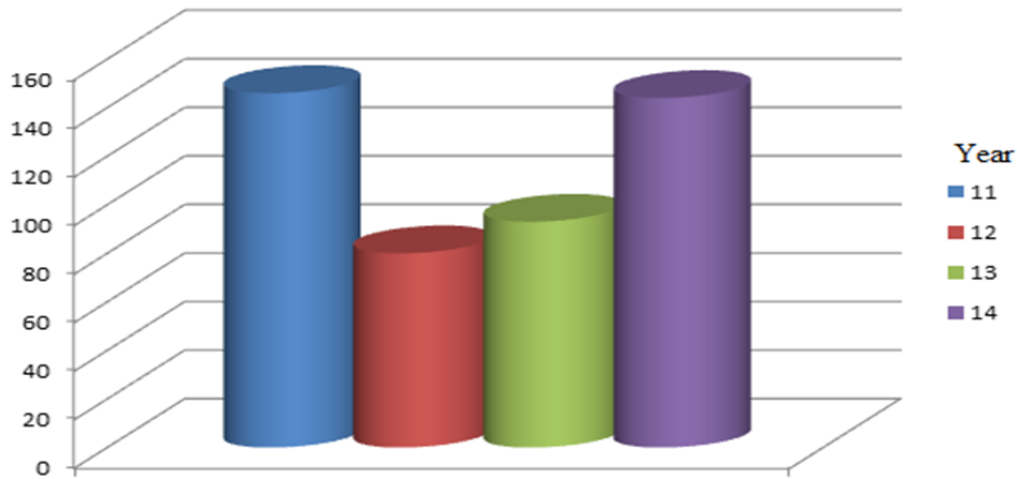
While some of the most important and basic reasons which affect the performance of the students in higher secondary education system were selected to investigate their effectiveness on education sector. These basic reasons were:

- Cheating.
- Politics (Political Activities of Students).
- Fraud/Fake Documentation,
- Government's Behaviour.
- Non-Qualified Faculty.

### **4. Methodology**

The method of data collection deployed for this research was through questionnaire. The questionnaire was designed to explore certain traits and characteristic related factors that affect higher secondary education in Karachi. The higher secondary education as per the standards outlined by the Board of Intermediate Education Karachi, comprise of year 11 and 12 academic year. Higher Secondary Education is commonly referred to as "Intermediate Studies" locally. The pre-requisite for intermediate studies is 10th year or Matriculation (Secondary level). The authority that looks after the secondary education is BSE (Board of Secondary Education) Karachi. The population addressed through this questionnaire comprise of the students, currently involved in intermediate studies or have gone through this educational level most recently and are studying currently in undergraduate studies in different private or government universities located in Karachi. Out of 441 responses 226 respondent for this study were selected from different intermediate colleges in which 146 from year 11 and remaining 80 were from year 12, while 215 respondents were selected from different universities in which 93 were studying in their 1st year (year 13) while the remaining 122 were studying in their 2nd year (year 14) of undergraduate program.

This sample was resolved carefully to study, examine and analyse the responses produced against different socio-economic factors to investigate their effectiveness on education sector.



**Figure 1. Populace of the Respondent Students in Different Academic Years**

Students were grouped in a classroom they were briefed clearly about the questionnaire and it took on average half an hour to fill this questionnaire. Selection of students was at random. Out of these students, only those were selected at random, who were voluntarily willing to fill the questionnaires.

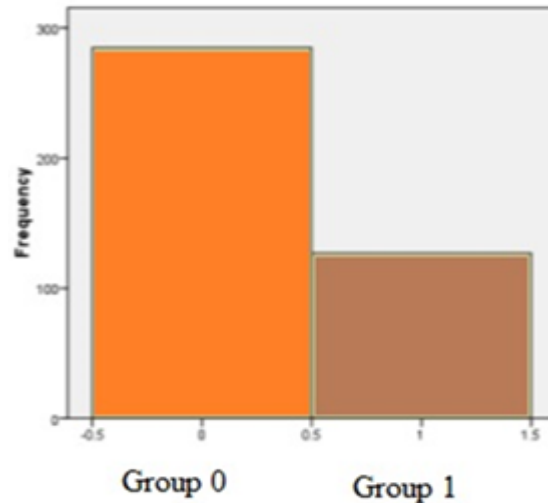
Through descriptive statistics the frequencies of different factors and reasons were going to be compared. Mean, Standard deviation, frequency distributions, different hypothesis techniques were used through appropriate statistical package.

## **5. Data Description and Interpretation**

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### **5.1. Area of Investigation 1**

The first finding of this study was that the two major reasons for dropping education according to the responses received from students currently indulged into the studies are, "Poverty" & "Unawareness about the importance of education". The comparison of responses of both the above factors with other remaining factors can be observed in Figure 2. In Figure 2,



**Figure 2. Compression of the Drop-out Factors which are Divided into Two Groups. Group 0- Poverty” and “Unawareness” , Group 1 - “Rest of the other Factors”**

Group 0 represents “Poverty” and “Unawareness” in combination, while Group 1 represent “Rest of the other factors”.

In order to study the profile of responses and to achieve a conclusive status in this regard the hypothesis technique (test on a population proportion) was applied whose null alternative hypotheses are given below;

***H<sub>0</sub>: “Poverty” and “Unawareness” are equally lethal as compared to the rest of the factors in terms of students’ drop rate.***

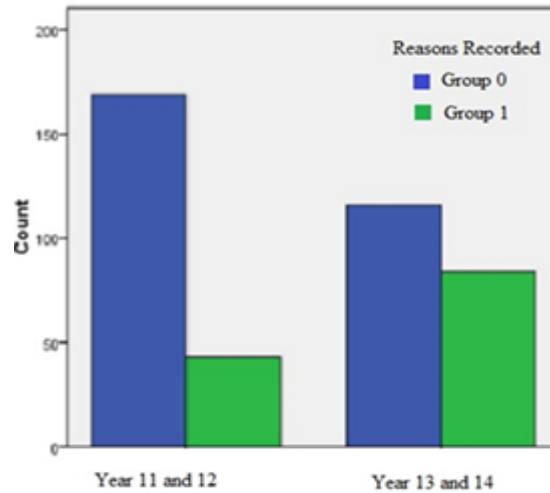
Against the alternative hypothesis as,

***H<sub>a</sub>: “Poverty” and “Unawareness” play a significant role (in students’ dropout rate) as compared to other reasons”.***

The result concludes that with  $\alpha$  (0.05) and  $Z_{calculated}$  (5.68)  $>$   $Z_{tabulated}$  (1.645), the null hypothesis is hereby rejected. Hence it appears that the “Poverty” and “Unawareness” collectively play a major role regarding the dropout rate of students during their pursuit for higher secondary education.

## **5.2. Area of Investigation 2**

It was very clear from the above hypothesis that the main reasons for discontinue education according to the respondents of the sample survey are Poverty & Unawareness about the importance of education. To study further the profile of the responses and to get some decisive status in this scenario the responses were again regrouped using the technique of recoding. Now this was done by creating “Group 0” and “Group 1” that represents “Poverty” and “Unawareness about the importance of education” respectively and names these groups as “Reasons Recoded”. These Reasons Recoded were correlated with students’ current level. The histogram plotted then for profile analysis is presented in Figure 3. Figure 3 shows comprehensive representation of the correlation.



**Figure 3. Students' Current Level of Education v/s Reasons Recorded**

In order to study the profile of responses and to achieve a decisive status in this regard the hypothesis technique was applied whose null alternative hypotheses are presented below;

***H<sub>0</sub> : “ Both the Reasons of Dropping Education are independent of Students' Current Level”.***

Against the alternative hypothesis as,

***H<sub>a</sub>: “Both the Reasons of Dropping Education are dependent of Students' Current Level”.***

In order to analyse and test hypothesis under independent sample, Pearson's Chi-Square was applied. With 95% level of significance, and degree of freedom (df =1), it was found that the p-value (0.000) <  $\alpha$  (0.05). Hence the null hypothesis “Both the Reasons of Dropping Education are dependent of Students' Current Level” is rejected.

### 5.3. Area of Investigation 3

The Profile Analysis of responses generated against the question regarding “Family's Highest Qualification” indicates that most of the respondents belong to families in which highest qualification is “Masters”. Table 1 highlights the comparison.

**Table 1. Families Highest Qualification**

	Frequency	Percent	Valid Percent	Cumulative Percent
PhD	14	3.2	3.2	3.2
Masters	286	64.9	64.9	68.0
Graduation	110	24.9	24.9	93.0
Intermediate/Diploma	20	4.5	4.5	97.5
Matriculation	11	2.5	2.5	100.0
Total	441	100.0	100.0	



#### 5.4. Area of Investigation 4

The response against the question regarding quality of education in Karachi is reflected through the normal curve shown in Figure 4. In Figure 4 degrees of quality of education are 'very good', 'Good', 'Average', 'Bad', 'Worst' are represented by histograms 1,2,3,4,5 respectively. On these histograms a curve has been fitted which is a bell-shaped normal curve. The normal curve in the figure authenticates the data by showing that the middle category i.e. of moderate level is the main strength of the graph. The fact that natural data is always normalized, can also be seen in Figure 4 output from the responses, that the majority in not among the very good or below the worst level.

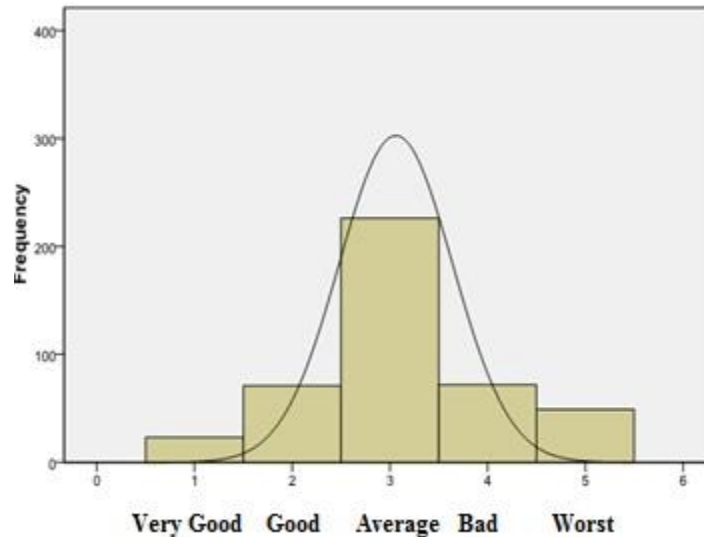


Figure 4. Quality of Education in Karachi

#### 5.5. Area of Investigation 5

An amazing fact that emerged during the study is the reason of the interest of students to study in Government or Private. It seems that the good A-1 grades achieved mostly by the students who studied in private school sector.

In order to achieve a conclusive status in this regard test hypothesis under Independent Sample Student's t-test was applied whose null alternative hypotheses are given below;

**$H_0$ : "Matriculation grades are independent of School type".**

Against the alternative hypothesis as,

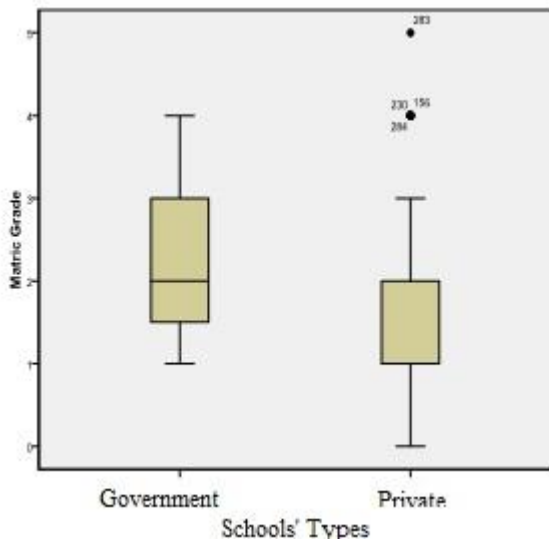
**$H_a$ : "Students of Private Schools" acquired good grades in matriculation examination rather than the "Students of Government Schools".**

With 95% level of significance it was found that the p-value (0.000) <  $\alpha$  (0.05). Hence the null hypothesis is rejected and it is concluded that "Students of Private Schools" acquired good grades in matriculation examination rather than the "Students of Government Schools". The test values are presented in Table 2

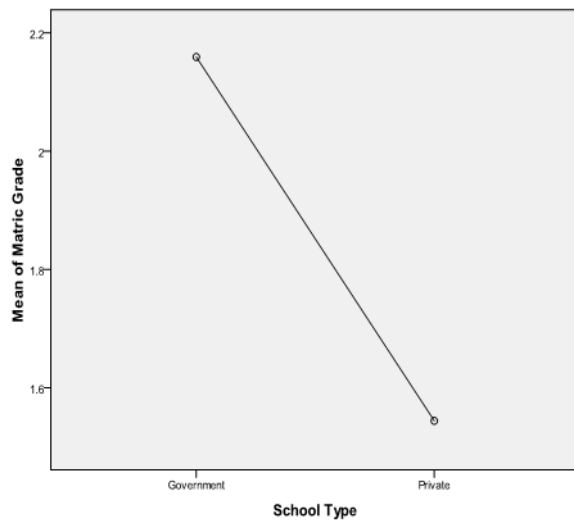
**Table 3. Independent Samples Test on the Independence of Matriculation Grade and School Type**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
			Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Matriculation Grade	Equal variances assumed	.002	.966	4.560	39	.000	.615	.135	.350	.880
	Equal variances not assumed			.381	2.004	.000	.615	.140	.333	.897

Box-and-Whiskers Plot & Means Plot between Matriculation Grade and School Types are given in Figures 5(a) and 5(b). Notice that both datasets are not balanced around the same value; evidently the mean of Government School's Students Grade is "near" 2, while the mean of Private School's Students Grade is "near" 1, as shown in Figures 5(a) and 5(b). The conclusion which can easily be attained from these figures is that, the average grades achieved by the students of Government School are "A", while the average grades achieved by the students of Private School are "A-1". Since there were some outliers in the sample of private school which can easily be observed in box plot of Private School but they are very negligible as compare to sample size.



**Figure 5a. Box Plot of Matriculation Grade & School Type**

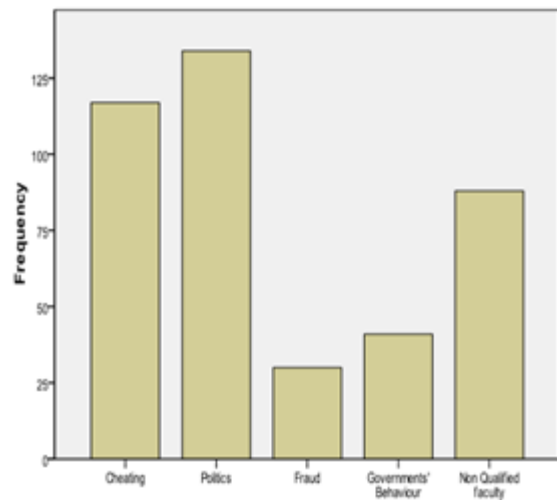


**Figure 5b. Means Plot of Matriculation Grade & School Type**

## 5.6. Area of Investigation 6

The bar graph which was formed against the responses of the question about basic factors due to which performance of the student mostly affected is given in Figure. 6. It can easily be observed that the reason like Cheating and Politics/Political Activities are very harmful and discouraging for the performance of the students in pre graduation studies.

Under the viewpoint of performance of the students it was anticipated that more than 60% of the respondents from the sample expressed “Cheating” and “Politics” as the most harmful elements for students’ progress towards higher secondary education in Karachi as compared to other factors.



**Figure 6. Factors that affect Students’ Performance**

This observation can further be tested through formulating the null hypothesis as

***H<sub>0</sub> : “Cheating” and “Politics” are equally lethal as compared to the rest of the factors in terms of students’ drop rate.***

Against the alternative hypothesis as,

***H<sub>a</sub> : “Cheating” and “Politics” play a significant role (in students’ dropout rate) as compared to other reasons”.***

With  $\alpha$  (0.05) and  $Z_{calculated}$  (4.0496) >  $Z_{tabulated}$  (1.645), the null hypothesis is hereby rejected. Hence it appears that the “Cheating” and “Politics” are the most harmful factors regarding the performance of students during their pursuit for higher secondary education.

## 6. Conclusion and Discussion

This study was focused on some of the factors inside & outside of the institution that plays a vital role regarding the dropout rate of students during their pursuit for higher secondary education. According to our first finding the two main reasons for the students to drop their education in a mid-way are “Poverty” and “Unawareness about the importance of education”. The first and the leading factor that influences dropout (*i.e.*, Poverty) cannot be resolve

rapidly but second major factor (*i.e.*, Unawareness about the importance of education) can be reduce on taking quick and appropriate steps. For this, the key aspect for the educationist is to educate people about the importance of education effectively and adequately so that the students may be able to keep continuing their education and also show quality performance in their academics.

The education of Parents also has major effects on students' academic performance. Since the data which was collected from different institution of Karachi show some biasness towards those students, which belongs to the families in which the highest individual qualification is Graduation or more.

It was also revealed that students of private schools acquired good grades in matriculation examination rather than the students of government schools; this is because the standard of the government schools is very low.

It was expected that in the cosmopolitan city like Karachi the education level should be of good standard. But data analysis disclosed that more than 50% of the respondents know such students in their domain who are actually the dropouts because. It was also being observed that the normal curve against the responses of the question showing that the education level of Karachi is not of good standard.

It was claimed that the students who take part in political activities during studies didn't give proper attention to their studies. Their first priority is to support the political party from which they belong rather than to focus on their studies. The data analysis proved the above claim to be true, and found that the most harmful factors which affect the performance of the students were Cheating and Politics.

## 7. Recommendations

It is recommended that the Government should start Educational Card scheme and scholarships for the needy students, to keep continue their education. To increase the awareness of education among people, government should initiate education awareness programs in the underprivileged areas. Form the committee with specified qualifications to contribute their services in their areas of work or residence under organized bodies that can be formed for this purpose by the government. Through this, the trend of unemployment may decrease.

Government and its stake holders should increase the expenditure on higher secondary education sector.

The students' performance should be improve if the administration of the institutions provides proper leaning facilities to the students and also improve the environment of the institution. Political activities among students should completely be in control of the institution.

The student should perform well if they are properly guided by the parents and also by their teachers about their activities. If the students know well about their extracurricular activities and abilities then they performs well in every field of life.

Further research is needed to explore the problem through different statistical model [22], regression, correlation and time series techniques from more scattered geographical regions on the other factors such as student factors, family factors, motivational factors, behavioural factors, and situational factors etc. which could possibly effect on academic achievement at higher secondary education.

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