

# The Impact of Students' Intake Quality on the Performance of Engineering Undergraduates

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## Abstract

The quality of intake of students in terms of Z score to a particular course to different universities differs vastly in Sri Lanka. The students who get higher Z score goes to established universities mostly under merit category and the students from educationally disadvantaged districts with less Z score enter to the newly established universities. The variation in quality of intake in these newly established universities is greater and there is a concept that students' performance in the undergraduate program associated with the quality of intake. In this study the relationship between Z score and the student performance in the Engineering degree programme at the Faculty of Engineering, South Eastern University of Sri Lanka was analyzed for 92 students. This study revealed that the quality of intake has no influence on the performance of the students but gender has influence in the performance. This study emphasis the current partial quota system of allocation to different districts proportional to the population and educationally disadvantaged districts should exist.

**Keywords:** intake quality, grade point average, student performance, Z-score

## Introduction

Admission to the local students to the five engineering faculties in Sri Lanka at undergraduate is based solely on the results of the G.C.E. advanced level (A/L) examination. To enter in to the Engineering faculties, generally students sit for Combined Mathematics, Physics and Chemistry at G.C.E A/L. In 2001, Z score system was introduced for ranking the students at G.C.E (A/L). For the engineering degree program 40 % of the nationally available places is filled in order of Z scores ranked on all island basis, 55 % is filled in proportion to the total population in the 25 administrative districts and 5 % is filled in proportion to the population in the 13 educationally disadvantaged districts (University Grant commission, 2011). The quality of the student intake to the engineering degree programme is determined by the Z score of the students and it varies much due to this 3 levels allocation. The selected students' Z score variation for a study programme increases much due to this district quota system which is mainly introduced considering the educational disadvantage districts. There is a concept that students get low Z score in the educationally disadvantaged districts because of lack of educational facilities and if these students are given equal facilities with other district students, they will also perform equally. In addition, the need of graduates from all over island is also one reason for this quota allocation. An earlier similar study in the science degree program found that the quality of intake does not reflect on the final performance of the students but in the first year (Razmy, 2012). This study discuss whether the variation in the quality of intake reflect on the performance in the engineering degree programme.

## Methods

92 students' Z Scores and performance in the engineering degree programme at the Faculty of Engineering (FE), South Eastern University of Sri Lanka (SEUSL) were analyzed by using different statistical techniques. The student performance was measured by their grade point average (GPA) obtained in the first two semesters.

## Results and Discussion

The average Z score of the students entering to the FE, SEUSL was 1.1605 (95% CI, 1.1157, and 1.2052). As the Z score is not a linear ranking of the performance, it can be transformed into cumulative probability ( $\Phi(Z)$ ) of the standard normal random variable which rank the GCE A/L performance by its cumulative probability. The average cumulative probability of the students entering to the FE, SEUSL was 0.87178 (95% CI, 0.86188, 0.88167) which interpret that 95 % of the students coming to FE, SEUSL are from top 13.812 % to 11.833 %. The average GPA in the 1<sup>st</sup> and 2<sup>nd</sup> semesters were 2.40 (95% CI, 2.29, 2.52) and 3.12 (95% CI, 3.02, 3.23) respectively. A paired t-test indicate that there is a significant increase of 0.72 (95% CI, 0.65, 0.79) GPA in the 2<sup>nd</sup> semester compare to the 1<sup>st</sup> semester ( $P < 0.000$ ). It might be due to student adaptation to university education system.

Fig. 1 and Fig. 2 show the GPA of the students in the first and second semesters respectively and their overall cumulative probability ranking in the GCE (A/L) examination. Even though increasing trends in GPA were observed in both cases, the adjusted R-square values for liner fits were 0.4% and 1.9% respectively. It is because of higher variance form the fitted line. Therefore it can be interpreted that there is no significant relationship between the intake quality and the students' performance in the engineering degree programme.

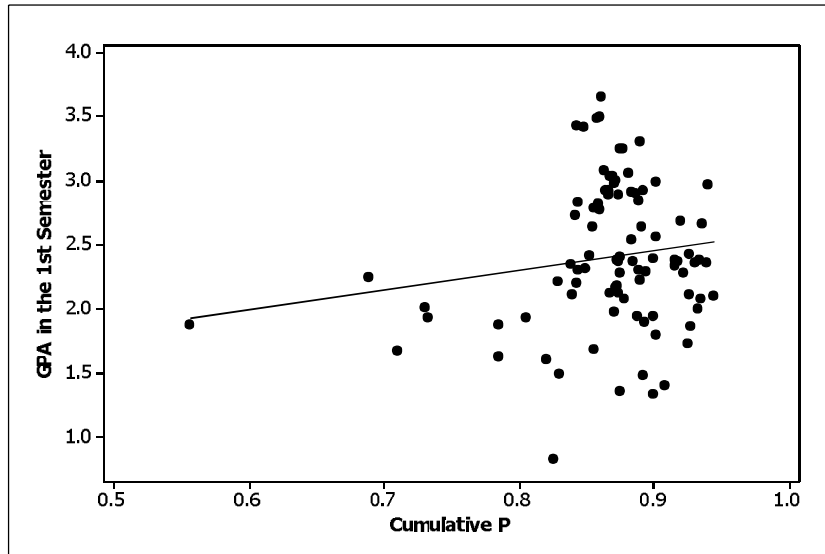


Figure 1:  $\phi$  (Z) Ranking and 1<sup>st</sup> Semester GPA

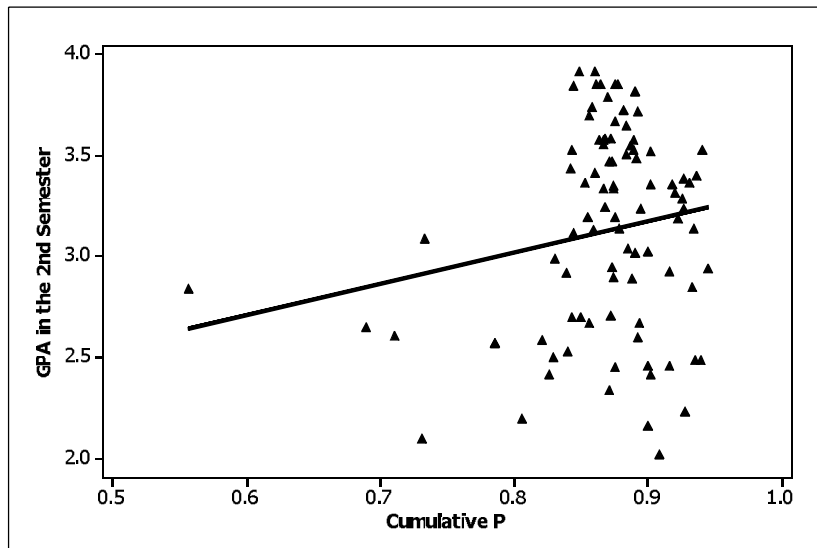


Figure 2:  $\phi$  (Z) Ranking and 2<sup>nd</sup> Semester GPA

The average Z score of the male and female student were 1.161 and 1.158 respectively and no significant difference was observed among them ( $P=0.955$ ). But surprisingly a significant difference in cumulative GPA (CGPA) was observed among the male and female students ( $P=0.015$ ). The average CGPA of the female and male students were 3.04 and 2.70 and the female students had obtained 0.338 (95 % CI, 0.61, 0.07) more CGPA than the male students. This statistically significant difference was observed for both semesters.

### Conclusion

The intake quality of the students represented by the Z score did not reflect any performance difference in the FE, SEUSL. However the intake quality difference had some influence in the performance of the students in the first year only in some

other faculties. As there is no reflection of Z score in the performance of the students in the Engineering degree programme, the partial quota system is not having any negative effect but produce graduates thorough out the island

### References

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