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Gender and Academic Achievement in Engineering Colleges

K. Krishnakumar[1] and Dr. Sunil Dutt[2]
[1]P.G. Student [2]Professor & Head
Dept. of Education and Educational Management,
National Institute of Technical Teachers' Training and Research,
Chandigarh-160019

Abstract **--- The descriptive study was carried out to determine the correlation between gender and academic achievement as measured by Grade Point Average (GPA) in the 1st Year Engineering Degree Examination. The sample consisted of 107 students of B.Tech. (Biotechnology and Biochemical Engineering) studying at 3 Engineering Colleges under the Kerala University. Out of this, 31 were boys and 76 were girls. Mean and Standard Deviation were calculated for boys and girls separately. Standard Error, σ_{dm} was also calculated for the sample. As the sample sizes were greater than 30, the distribution was assumed to be normal. z-value was computed by dividing the difference between means by Standard Error. z-value was obtained as $\pm$1.9256. At both 5% and 1% level of significance, this value was found to fall in the acceptance region, thus supporting the Null Hypothesis that there is no significant difference in the academic achievement of male and female students.**

Keywords --- Academic Performance, Grade Point Average, Mean, Standard Deviation, Standard Error, z-value

I. INTRODUCTION

The academic achievement is perceived as a measure of knowledge and skills acquired through formal education, usually indicated by examination scores/grade, grade point averages and degrees. Normally, the achievement level of the student is judged by the marks or score obtained in specified examinations. The extent to which a student has accomplished specific goals through a set of activities in instructional environments, specifically in educational setting constitutes the academic achievement.

Academic Achievement is affected by a number of factors with varying degrees of influence based on the situation. Some of the factors studied by previous researchers can be classified as:

- Student-related factors (Intelligence level, Entry level qualification/knowledge, Motivation level, Learning styles, Age and Gender)
- Family-related factors (Socio-economic status of parents : educational level, income etc., Involvement and support of parents, Family atmosphere)
- Environmental factors (Facilities and infrastructure provided by the institution, Effectiveness of teaching, Discipline in the institution

A number of studies are available in the literature which focused on the effect of demographic variables such as age and gender on student achievement. A review of the research literature suggests gender not a consistent predictor of overall academic achievement, although males tend to outperform females in certain types of courses while females do better in other types of courses. As such, there is an inconsistent relationship between gender and academic retention.

This descriptive study was carried out to compare the academic achievement of boys and girls in Engineering Degree Courses offered by the Kerala University. Academic achievement was measured by Grade Point Average (GPA) in the 1st Year Engineering Degree Examination.

II. LITERATURE REVIEW

A number of studies are available in the literature which focused on the effect of demographic variables such as age and gender on student achievement. Many studies indicated that girls do better and get higher grades thereby complete high school at a higher rate compared to boys. In addition, females are found to be better at spelling and perform better on standardized tests of literacy, writing, and general knowledge (National Center for Education Statistics, 2003).

Linver, Davis-Kean and Eccles (2002) have reported that for both boys and girls, maths grades fall over the course of junior high and high school [1]. Young women achieve comparable or higher levels in maths as males. Further, for young men, maths school grades is much more strongly related to maths interest than for young women in the same maths courses.

Dayioglu and Turut- Asik (2004) studied the effect of gender differences in academic performance in a public University in Turkey [2]. The study attempted to determine a significant gender differences in academic performance among undergraduate students in a public university in Turkey based on three indicators: university entrance scores, performance in the English preparatory school and in the programme the student is majoring in. The study revealed that a few female students manage to enter the university with lower scores. However, once admitted, they excel in their studies and outperform their male counterparts.

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Jabor, Machtmes, Kungu, Buntat and Nordin (2011) studied the effect of gender and age of students on their achievement in Mathematics [3]. The study was conducted on students of High School in United States. Female students were found to have higher GPA scores in mathematics than their male counterparts. Students' achievement could not be enhanced by mere delaying their school entry or retaining them in certain grade. Empirical studies have conclusively indicated that higher the age, lesser is their average academic performance and it continues to decline the older they get.

Fortin, Oreopoulos and Phipps (2013) proposed a "signaling" type model of academic achievement where educational expectations and likely influenced by parental desires, play a prominent role in determining, given a level of aptitude, in an individual's choice of optimal GPA [4]. Thus, high school students can choose a GPA level lower than their maximum attainable, if their post-secondary education plans can be enacted with the lower GPA level. The findings showed the predominance of girls at the top of the GPA distribution in their higher educational expectations, themselves linked to career plans including a graduate degree. However, boys prefer to enter military service or to attend a vocational school. Because the career plans of boys include more predominantly male occupations (craftsmen, protective service and military service occupations, engineers and architects) that do not require higher degrees.

Bozdogen, Gunaydin and Okur (2014) conducted extensive studies linking academic performance to various factors [5]. The survey study was carried out on students studying in the 5^{th} to 7^{th} grades in Turkey. No significant difference was found between the students' academic achievement in science course and gender. However, a significant difference in favour of female students with regard to their scores in performance assignment, which they took within the context of science course, was found. It was concluded that female students are more successful than male students in regard to performance tasks. This could be due to the fact that female students have more positive attitudes towards the assignments given at a significant level and also exhibited more positive attitudes than male students.

Yadav and Chahal (2016) studied the academic achievement of high school students of Mahendragarh district and found no significant difference in the performance of male and female students [6].

Indu Bala (2016) studied the academic achievement of Senior Secondary School students and found that girls have better academic achievement compared to boys [7].

However, Daniel (2016) came to the conclusion that boys performed better than girls in Mathematics, but no difference was found between boys and girls in English, Science and Social Studies [8].

III. MATERIALS AND METHODS

Although the availability of seats for engineering degree programmes in our country has increased exponentially over the past few decades, the academic performance of students during the course of study has declined sharply. There are various factors that affect the achievement of students in an educational programme, such as motivational level, intelligence and entry behaviour or entry qualification. Along with other parameters such as rank in the Entrance Examination and Board of study at +2 level, it was also proposed to undertake a study comparing the gender of students with their academic achievement in the First Year of the Engineering Degree programme.

The study covered students of selected self-financing engineering colleges affiliated to the Kerala University whose entry qualifications are:

a) Pass in the Higher Secondary Examination conducted by the Kerala State Board of Higher Secondary Education
b) Pass in the Higher Secondary Examination conducted by the Central Board of Secondary Education (CBSE)

The objective of the study was to compare the academic achievement of First Year engineering degree students of Kerala University in relation to their gender. The study was conducted to test the null hypothesis: 'There is no significant difference in the academic achievement of male and female students studying in First Year engineering".

All Fourth Semester (Direct Entry) students of B.Tech (Biotechnology and Biochemical Engineering) of the three colleges under Kerala University were covered in the study. Fourth Semester students were selected because the results of their First Year degree examinations are already available. Requisite data was collected from the students in regard to their academic achievement in First Year engineering. Information Sheet for collecting the requisite data was developed by the investigator.

Copies of the Information Sheet were administered to the students of the three colleges. Data regarding marks obtained in the qualifying examination and rank in the entrance test were also collected from records maintained in the colleges.

Descriptive Statistics such as measures of central tendency and correlation were computed for analyzing and organising the data. This was followed by techniques of Inferential Statistics such as t-test and z-test for drawing conclusions from the collected data. z-test was used for comparing the performances of male and female students in the 1^{st} Year examination.

IV. RESULTS AND DISCUSSION

The students constituting the sample were categorised into male and female. Out of 107 students, 31 were boys and 76 were girls. As both the sample sizes were above 30, these were considered as large samples and standard error of their means was calculated. Only 7 of the 31 boys and 31 of the 76 girls secured full pass and were awarded GPAs. The failed students were assigned GPA of 0 for the purpose of calculation. The means were obtained as 1.67 for boys and 3.01 for girls. Standard Deviations were obtained as 3.096 and 3.648 for boys and girls respectively. Z-value was found to be 1.9256.

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As the sample size is greater than 30, the distribution was assumed to be normal. At 5 % level of significance, the value of z could fall between -- 1.96 σ and +1.96 σ. The obtained value was + 1.9256 which was within the acceptance region indicated above. Therefore, the Null Hypothesis was accepted at 5 % significance level. At 1 % level of significance, the value of z could fall between -- 2.58 σ and + 2.58 σ. The obtained value was + 1.9256 which was within the acceptance region indicated above. Hence, the null hypothesis is accepted at 5 % significance level.

Thus, the Null Hypothesis was accepted at both 5% and 1% levels of significance. We can conclude that there is no significant difference in the academic achievement of male and female students studying in First Year engineering.

Possible reasons for this result were analysed as follows: It is a universal fact that all human beings are born with certain capabilities, which vary in degree from person to person. But no such differences can be observed between man and woman, except physical differences. Hence, we can conclude that both the genders are provided with equal amounts of intelligence.

We have to conclude that both the genders are equipped with comparable learning capabilities, but there may be fields of study particularly suited for a particular gender.

REFERENCES

[1]. Bozdoğan,AykutEmre; Günaydın, Esra;&Okur, Alperen (2014). An Examination of Secondary School Students' Academic Achievement in Science Course and Achievement Scores in Performance Assignments with Regard to Different Variables: A Boarding School Example. Participatory Educational Research (PER) Vol. 1(2), 95-105.

[2]. Dayioglu, Meltem Turut-Asik, Serap (2004). Gender Differences in Academic Performance in a Large Public University in Turkey. ERC Working Papers in Economics, 04/17, December 2014

[3]. Fortin, Nicole M., Oreopoulos, Philip & Phipps, Shelley (2013). Leaving Boys Behind: Gender Disparities in High Academic Achievement. Working Paper 19331,National Bureau of Economic Research, Cambridge

[4]. Jabor, M. Khata., Machtmes, Krissana, Kungu, Kenneth; Buntat, Yahya & Nordin, Mohd. Safarin (2011). The Influence of Age and Gender on the Students' Achievement in Mathematics. International Proceedings of Economics Development & Research; 2011, Vol. 5 Issue 2,302-304.

[5]. Linver, Miriam R., Davis-Kean, Pamela E. & Eccles, Jacquelynne S. (2002). Influences of Gender on Academic Achievement-presented at the biennialmeeting of Society for Research on Adolescence, New Orleans, L.A.

[6]. Daniel, Apaak (2016). Gender Effect on Academic Performance of Junior High School Athletes in Ghana: International Journal of Physical Education, Sports and Health 2016 3(2) : 355-364

[7]. Indu Bala (2016). A Survey: Gender and age Affects Academic Achievement of Senior Secondary School Students: International Journal of Multi-disciplinary Research and Development, ISSN:2349-5979, Volume 3, Issue 12December 2016,pp. 132-134

[8]. Yadav, Teena & Chahal, Dinesh (2016). The Impact of Caste, Region and Gender on Students' Academic Achievement in Mahendragarh District: International Journal of Advanced Education and Research, ISSN:2455-5746, Volume 1, Issue 7, July 2016, pp. 33-36.