Impact of Academic and Social Factors on the Academic Performance of First Year Engineering Student

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Abstract: To study about the learning outcome and measuring the same has considerable amount of complexity. Each student has his/her own way of learning pattern and every individual is prone to deviate from learning because of the pace of distraction for them. This study focuses on measuring and assessing students learning outcome. Assessment primarily starts with the measurement of outcomes. Measurable outcomes involve student's behavior / outcome, assessment method and criteria for success. Learning outcomes are measured with student's knowledge, skills, regularity in attending regular classes, daily activities / time spent on each activity and values on completion of a courses/program. It can be measured directly or indirectly. This study will formulate a strategy to improve the success rate of the students.

Keywords: outcomes, learning outcome, program outcome, assessment and students behavior

I. INTRODUCTION

Measuring Learning outcome of the student in current generation is difficult since they are attracted by the fast developing technologies like social media, You tube, twitter etc.,. Probability of focus towards these media is more and it has more impact in their learning curve. There are many surveys regarding the performance measurement of students and staff. Authors studied student entry level college calculus success and failure based on performance, interview and attitude of the students [1]. Authors studied about the team based training and they found that the cooperative learning has a positive impact on attitudes in a training set [2]. In [3] suggested the teacher's behavior to improve students' performance. They found that teachers who are aware of instructional goals, who know about student's mentality in terms of their awareness about instructional process, who monitors student's performance regularly, will increase student's performance. Authors also suggested that fair evaluation by teachers, the student – teacher interpersonal behavior will improve student's attitude towards learning and students' performance. [4].Investigated student /teacher attitudes and student study behavior. Students study impact on using instructional multimedia while they learn [5]. [6]

Authors analyzed the learning pattern of students when they use multimedia technologies for chemistry program. [7] Study the validity of modeling science achievement with three social psychological variables (active learning, school connectedness and science attitude) and with two self-perception variables (self-confidence and science value). [8] Studied about the improvement of clinical performance in a medical field. [9] Studied about the participation of students in a science and technology contest. Authors suggested a strategy to encourage students in solving real world problems. They stated that the student problem solving attitude is positively correlated to their perception of their own knowledge enrichment, their own thinking-skill enhancement as a result of participating in a science and technology competitions. [10] They examined the effect of using new Computer Supported Collaborative Learning (CSCL) device in a learning system, specifically an interactive table top. They stated that the use of an interactive table tops in learning system has improved on elementary students' attitudes toward collaborative technologies, mathematical achievement, and the gender gap in mathematics. Studied [11] the impact of attitudinal antecedents on entrepreneurial intention. Authors found that the students learning motivation strongly correlates with their innovativeness and their innovation capabilities affect the entrepreneurship intention, Junior year students need more facilitation to motivate their learning. The engineering students 'innovativeness' is found significantly and strongly correlated to 'self-efficacy' and significantly to 'attitude'. [12] Explored a learning behavioral model of Project Based Learning (PBL) for senior high school students in the context of STEM (science, technology, engineering, and mathematics). [13] Studied the effects of teaching mathematics using an online flexible educational game on students' attitude an d it is compared with the traditional method of solving mathematical problems. [14] The success of efforts to integrate technology with design education is largely affected by the attitudes of students toward technology. Authors finds that the attitudes of design students toward the use of computers in design and its behavior.

II. PURPOSE OF THE STUDY

Students learning pattern, daily time spent on routine activities, marks scored in school level, regularity in attending the classes have impact on their academic performance. The research questions are as follows:

1. What impact does the student daily activities and time spent on each activity have on students academic performance?

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2. Does the student attracted by social media? Is it affecting their academic performance?
3. Does the student spent on social activities and internet browsing affects their academic performance?
4. Does the student spent on knowledge gathering through TV, affect their academic performance?
A. Hypotheses are as follows:

Fig 1. Represents the research model of setting the Hypothesis.

H1: Regular in attending classes is positively associated with student's performance

H2: School performance is positively associated with college entry level performance of a student

H3:Time spent on social media/ social activities is negatively associated with student's performance.

H4: Time spent on TV watching to gather general knowledge is positively associated with real world problem solving.

III.PSYCHOMETRICS OF THE QUESTIONNAIRE DESIGN

A. Interview based Questions:
- Studying with students who are close friends
- Studying with students who are not close friends.
- Participating in technical dialogue when they find free hours.
- Participating in design or any other innovative thinking.
- Attitude towards attending design competitions, extra classes and workshops.
- Chasing the teachers, when they have doubts to clear.
- Placing emphasis on understanding the basic foundations on each course.
- Getting help from senior students
- Time spent on each activity in daily
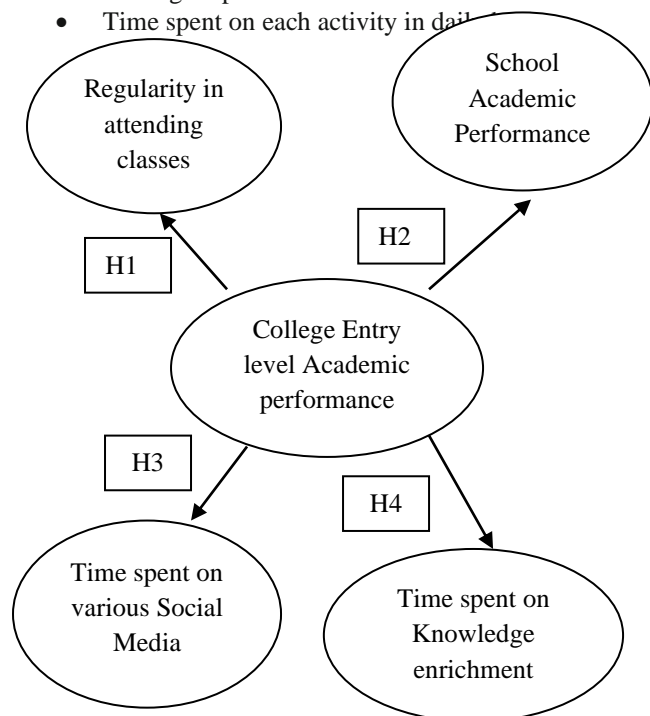
Fig: 1 Research Model

E. Participants

The participants of the study were Entry level under graduate students from Kumaraguru College of Technology. A total of 700 students in the first year were asked to complete the questionnaire. For all questions rating varies from 1-5.Preprocessing like missing responses, deleting irrelevant answer and outlier analysis is done on the collected data. Finally the total relevant and valid questionnaire for analysis is (N = 510). The analysis sample consists of 377 (74%) males and 133 (26%) females. The school level distribution of the participants are from Tamilnadu State board (81%), CBSE(15%) and others(4%).

IV.VI.STATISTICAL ANALYSIS

In order to achieve the objectives of the study, the collected data is tabulated for statistical analyses. Mean, standard deviation and correlation were calculated. The Z-test and Chi-square tests were employed to find the statistical significance of the differences between the means of respective groups. Analysis of data was interpreted under the following headings.

1. Comparison of academic achievement of engineering college students with Higher Secondary marks and first semester SGPA marks.
2. Correlation analysis between higher secondary marks and first semester SGPA marks.
3. Correlation analysis between attendance percentage and first semester SGPA marks.
4. Comparison of academic achievement in relation to knowledge enrichment.
5. Comparison of academic performance of engineering college students with their social activities.

F. Comparison of Academic Achievement of Engineering College students in higher secondary marks and first semester SGPA marks.

To analyse the difference in academic achievement of engineering college students, the data between his/her Higher Secondary Marks and First Semester SGPA were compared. The mean scores and SDs along with z-value test (significance of mean difference) is given in the following table.

Marks	N(Total)	Mean	S.D	S.E	z-value
I Sem SGPA	510	61.63	33.59	1.52	18.06
HSC Marks	510	89.09	7.46		

Table 4.1

Table 4.1 reveals that mean values and SDs of first year engineering college students for academic achievement are 61.63, 89.09 and 33.59, 7.46 respectively.

Standard error of mean difference was calculated as 1.52 while the z-ratio came out to be 18.06, which is significant at 0.01 levels. So it is evident that first year engineering college students' performance significantly differs with their Higher Secondary Marks.

G. Correlation analysis among Higher Secondary Marks and first semester SGPA marks.

To explore the relationship between academic performance in higher secondary and first semester, the results of Higher Secondary (12th) marks and first semester marks (SGPA) of 510 students were compared. The analysis by Karl-Pearson correlation coefficient Method is shown below:

Pearson Correlations

		SGPA%	12 TH %
SGPA%	Pearson Corr.	1	0.43354
	Sig.	--	0
12 TH %	Pearson Corr.	0.43354	1
	Sig.	0	--

Table 4.2

Academic Performance / Time spent in Social media/ activities	Average marks less than 75	Average marks greater than 75	Total	χ^2 Value
Less time spent	22	169	191	
Moderate hours spent	72	92	164	196.80
More time spent	135	20	155	
Total	229	281	510	

Table 4.4

level of significance as shown below in table 4.4. Since the Chi-square value is 1.4826, it is concluded that the time spent by the college students towards knowledge enrichment does not affect the academic performance of the students at college.

H. Comparison of academic performance of engineering college students with their time spent on social media.

The student's attitude towards spending time on social media and activities were measured. To analyse the significant difference between academic performance of engineering college students and time spent on social media, Chi-square test is applied on the data under 5% level of significance as shown below in table 4.5.

Academic Performance / Time spent to enrich Knowledge	Pass	Fail	Total	χ^2 Value
Less time spent	274	73	347	
Moderate hours spent	101	35	136	
More time spent	21	6	27	1.4826
Total	396	114	510	

Table 4.5

The χ^2-test value reveals that the academic performance of the first year engineering college students is significantly reduced by the time spent on social media.

V.CONCLUSION

The research conducted in this survey and study indicates the challenges faced by students during their first year of engineering studies for all courses. Student attitude had the strongest correlation with student performance. Attitudes are influenced by social media and pattern in time spending in various fields. Analysis shows that regularity in attending classes has positive impact on their performance. Time spent on social media for entertainment has negative impact on their academic performance since they are deviated from their regular academic work. It is important to motivate students to do the preparation by understanding the concepts, regularity in attending the classes etc., This survey and analysis helps students to avoid an unsuccessful first year in college level courses.

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