

Attendance in Class and Motivation to Study in an Engineering Course: Exploring their Associations and Gender Differences

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Abstract: There is an increasing evidence for associations between students' attendance and their academic achievement in general. However, it is not clear how it is related to students' motivational behaviours such as, study planning and management, especially in the context of engineering education. This study examines this relationship on a sample of engineering students (N=98). The results showed a significant positive relationship between student attendance and study management and between study planning and study management behaviours. Significant gender differences revealed that female students reported higher levels of attendance and study management behaviours than male students. Further research is required to pursue this initial understanding of motivational orientations of engineering students by tracking their attendance and motivational behaviours over time. Limitations of the current study are discussed and recommendations for future research are presented.

Keywords: attendance, motivation, engineering students, study management, study planning, gender differences.

1. Introduction

It is commonly believed that the rate of attendance is related to the likelihood of increased learning and student performance in the examinations. A lot of research has been done in the area of attendance influencing students' final grades in the examinations. Students who attend lectures have shown good results while those with poor lecture attendance have achieved poor results in the examinations (Khan et al. 2003); a negative correlation has been found between absenteeism and test scores (Flournoy & Hyde, 1984; Riggs & Blanco, 1994; Dhaliwal, 2003; Khan et al, 2003). Students' scores in the examinations are considered to reflect their learning and class attendance is likely to be beneficial for learning, irrespective of teaching modes used and learning experiences provided. This, then, leads to the question, 'Are students motivated to learn? And if so, do they translate their motivation into their behaviours of study planning and study management?'. This paper aims to examine the relationship between student attendance and their motivational behaviours and the gender differences in them.

2. Background

Research that has been done so far mainly focuses on the relationship between class attendance and academic achievement. It was found that the rate of attendance decreases from the beginning to the end of the semester and there is a moderate correlation of attendance with grade for undergraduates (N=959) pursuing psychology at the Pennsylvania State University (Van Blerkom, 2001). It has been found that there is a significant positive association between attendance and grades in the first year students (N=2510) pursuing different courses at the Stellen Bosch University. A varying pattern of grades were also observed amongst students having different percentages of attendance. Male students had reported lower attendance and grades in comparison to the females in 118 students pursuing management courses (Rath&Kar, 2012).

Similar studies have been conducted to explain the meta-analytic review of the relationship between class attendance and grades in addition to student characteristics. Attendance appears to play a significant role in the performance of a student in individual classes and college GPA as shown by Crede et al (2010) in their research. They reported that attendance in the science classes has a very good impact on the grades when compared to the non-science classes. This study was carried for students attending science and non-science classes (N=11,110). Despite the intuitive logic influencing attendance, contemporary evidence proves that motives do not really impact on the attendance level or in simpler words it demonstrates a weak relationship with attendance for students of the National College Athletic Association (NCAA), United States of America (N=207) (Yu Kyoun et al, 2013).

The probable reasons for the shortage in attendance could be due to lack of motivational behaviours, illness, interference of personal life with classes, mindset, overload, assignments to be completed, friend circle etc. The lack of attendance mainly affects the motivation of the students as the students lose track of the course and which in turn reduces their interest in the chosen course. Performance of the students who got demotivated from the course is more likely to result in poor grades. Motivation to study is considered to be an essential requisite for students to attend the class. They may have good intentions to study well. Unfortunately, good intentions are not good enough unless these motivational cognitions are put into action through motivational

behaviours such as, study planning and study management (Martin, 2007; Plenty & Heubeck, 2011, 2013). Reeve (2013) in his study on university students' motivation and engagement in Korea (N=248) found that behavioural engagement in learning was the strongest predictor of achievement (effect size=.20) among other predictors, such as, cognitive and emotional engagement (effect sizes = .06 and .07 respectively). Apparently, behavioural facets are necessary to understand why students attend classes or not. It has been a general perception that female students are more persistent in their attendance in classes. However, there is no empirical evidence to claim that females report better levels of attendance and thereby their attendance could be related to their motivation to study.

Attendance has been one of the major issues in Indian educational system. It was found that average attendance in public and private schools across India was 64% and 75% respectively, which results in overall average attendance of 70 % (Gretchen et al., 2005). In the engineering colleges average attendance vary for each year from first year to final year which shows a decreasing pattern and it can be approximately considered to be less than or equal to 70% in the Indian scenario. In the context of lack of empirical evidence, there is a dire need to examine the relationship between motivation and attendance of students in the engineering colleges. In particular, at the Hyderabad Institute of Technology and Management, average attendance is observed to be in the range of 60-70%. Specifically, for the second year engineering students for the course, 'Probability Theory and Stochastic Process', it is found to be an average attendance of 70%, although this is not poor, it is not satisfactory for a professional course.

This paper focuses on examining students' attendance and motivation and gender differences in them. The research questions and the related hypotheses in this study were as follows:

Research Question 1: How are students' motivational behaviours related to their attendance in class?

Hypothesis 1: It was expected that there would be a positive relationship between students' attendance and motivational behaviours.

Research Question 2: Are there any gender differences in students' motivational behaviours and their attendance in class?

Hypothesis 2: It was expected that there would be gender differences in the level of attendance and motivational behaviours.

3. Method

A. Participants

This study was conducted on students completing the course, "Probability Theory and Stochastic Processes" (N=98; males=56; females=42) of second year Electronics and Communication Engineering (ECE) at Hyderabad Institute of Technology and Management (HITAM).

B. Instrumentation

A survey was designed with questions related to students' attendance and their interest in the unit and it contained 20

questions, set on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). It included questions related to attendance, and motivational behaviours, study planning and management, such as, 'After attending the classes I am getting more and more interested in the subject'; 'I try to attend all the classes'; 'Before I start an assignment, I plan out how I am going to do it'; 'When I study, I usually study at times when I can concentrate best'.

C. Procedure

The questionnaire was completed by students studying the unit "Probability Theory and Stochastic Processes" during normal lesson time in June. Before completing the questionnaire, the students were informed that the purpose of the research was to learn more about their rate of attendance and motivational behaviours towards study. They were ensured that their responses would be kept confidential and were encouraged to give honest response to the questionnaire. They were also asked to fill in the information whether they were male or female on the questionnaire. All students who participated provided complete data set. They completed their questionnaire independently at their own pace. This took 10 - 15 minutes.

D. Statistical Analyses

The statistical analyses on the dataset were performed using SPSS Version 24.0 (2015). The statistical procedures included descriptive analyses of the data, along with examining the Cronbach's alpha, testing the reliability of the scales. T-tests and analysis of variance (ANOVA) and Pearson's correlations between the variables were administered to the dataset to compare the means of the scales considered in this study.

4. Results

The descriptive statistics in Table 1 show the mean scale scores for attendance, study planning and study management. The internal consistency of the scales expressed through reliability coefficients (ranging from $\alpha = .60$ to $.69$) was moderately strong. It is also evident that the means and variances of all constructs were highly consistent over time. Inspection of residuals for study planning and management showed that the non-normality of distribution did not affect the analyses negatively.

Students reported high levels of attendance and study management than study planning, with the means of 5.62 and 5.68 (SD= .88 for both) respectively. They reported lower levels of study planning behaviours ($\bar{x}$ =4.90; SD=1.07). When the correlations among the scales were examined, the associations between attendance and study planning, and study management and study planning were significant at the .01 level. There was no significant relationship between attendance and study management, as shown in Table 2.

Table 1. Descriptive Statistics

Scale	N	Male	Female	Mean	Standard deviation	Skewness	Kurtosis	Cronbach's Alpha
Attendance	98	56	42	5.62	.88	-.481	-.32	.60
Study Planning	98	56	42	4.90	1.07	-.685	-.07	.64
Study Management	98	56	42	5.68	.88	-.755	.70	.69

Table 2. Correlations among Attendance, Study Planning & Study Management

Scale	1	2	3
1 Attendance	1	.312**	.123
2 Study Planning	.312**	1	.268**
3 Study Management	.123	.268**	1

** . Significant at the .01 level.

To examine the gender differences in the three variables considered in the study, One-way Analysis of Variance was administered to the data set. It showed that there was a significant difference between males and females in attendance and study management behaviours, in which female students reported higher levels in both of them. However, their effect sizes were considerably small, as shown in Table 3.

Table 3. Gender Differences: Descriptive Statistics and t values

Scale	Gender	N	Mean	Standard Deviation	t value	df	Sig.	Eta squared
Attendance	Male	56	5.43	.82				
	Female	42	5.87	.89	2.56	96	.012*	.01
Study Planning	Male	56	4.75	1.19				
	Female	42	5.10	.89	1.58	96	.119	.01
Study Management	Male	56	5.45	.92				
	Female	42	5.99	.75	3.08	96	.003*	.01

*. Significant at the .05 level.

5. Discussion

The main purpose of the study was to examine the relationship among student attendance, their study planning and management behaviours. The results showed that there was a significant positive relationship between attendance and study management and study planning and management. In addition, there were significant gender differences in students' reports of their attendance and study management behaviours in which female students reported higher levels than male students.

Considering the positive relationship between student attendance and study planning behaviours, the current results, consistent with the hypothesis, reveal that when students attend classes regularly, they tend to know what is being taught in class and on what assignments they need to work. Once they are aware of the amount of study they need to do, they are more likely to plan out how to go about preparing for understanding the concepts taught in class. Van Blerkom

(2001) suggested that when students absent themselves from several classes early in the semester, they do less well on their first examination to their disappointment. This may discourage students, eventuating in making them miss more classes. This could reflect a spiralling effect of absenteeism, leading to poor study planning and management due to lack of awareness of the content covered in class, which would result in even poorer grades. This explanation is also related to socio-cognitive perspective, which argues that students' decisions of not attending classes are based on their self-belief, which is one of the motivational factors (Martin, 2007) and whether they are capable of continuing the course or not (Bandura & Schunk, 1981; Schunk, 1984, 1991, 2000; Schunk & Zimmerman, 1997; Zimmerman, 1989; Zimmerman & Martinez-Pons, 1990). Consistent with these research findings, the current results reiterate the importance of student attendance in class and its association with their motivational behaviours towards their study.

A significant positive association between study planning and management behaviours shows that when students are able to plan their study requirements they are able to translate their planning to behaviours related to organizing themselves to study for their exams in an effective manner. This association implicitly indicates the significance of motivational behaviours in the light of regular attendance. However, the absence of a significant relationship between attendance and study management apparently demonstrates that study planning behaviours could occur only when students attend classes and study management is pointless without study planning, which in turn depends on student attendance in class.

Consistent with the hypothesis, the significant difference in attendance, as reported by male and female students showed that female students reported higher levels of attendance and study management behaviours than that of male students. However, the effect size was small ($\eta^2 = .01$). This indicates that female students tend to attend classes with much interest and so they are able to manage their study behaviours, such as, choosing the appropriate time and place to study where they can focus on what they are studying. Higher levels of study management behaviours reported by female students compared to male students are consistent with the previous findings (Narayanan, Rajasekaran & Iyyappan, 2007).

The current findings clearly suggest that faculty members need to adapt engaging practices of engineering education so that students are motivated to attend classes and to plan and organise themselves to study during the course. Perhaps, different teaching and learning strategies have to be adapted to motivate male and female students. This might warrant faculty improvement programs addressing innovative teaching techniques on a regular basis, keeping abreast with the developments in the area of pedagogy of different engineering courses.

6. Limitation & Recommendations

The findings of this study are to be viewed in the context of some limitations. The study is based on a single college sample, drawn from an urban context, where the importance laid on education could be more compared to a rural college. A sample drawn from a rural setting, perhaps, would show whether the same results of correlation and gender difference could be identified in the engineering course. Students' personal factors related to their lack of attendance are not considered in the study. Future research could also focus on relating attendance and motivation to a criterion variable such as, final grades. In addition to self-regulatory behaviours such as study planning and study management which are used to measure motivational behaviours, class room engagement could also be observed and used in the analysis to assess student motivation.

Student attendance appears to be a significant component of student motivation in the engineering course. The gender differences that emerged in the current study shows that male student may require more assistance than female students to sustain their interest in the course, to attend classes and focus on their study through developing proactive motivational behaviours towards their study.

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