

Enhancing Engineering Education in an Indian Education System: WebBlogs

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Abstract— India has recently (2014) become a permanent member of the Washington Accord. In order to meet the international standards in engineering education, private Indian Engineering Colleges should improve teaching and learning strategies. This paper mainly focuses on usefulness and acceptance of educational blogs as a reflective, collaborative and active learning tool for engineering education. Our preliminary study reveals that students are interested to use blogs as learning tool. Students agreed that blogging not only helped them to strengthen their knowledge of the subject, but also empowered them to express their opinions more easily when compared to classroom

Keywords— -Webblogs, reflective learning, collaborative learning, engineering education

I. INTRODUCTION

Engineering Education is one of the most vital part of our education system. India today is the second largest higher education network in the world. Universities in India are set up by the Central or the State Governments by the means of legislation, while colleges are established by either State Governments or private bodies/trusts. All colleges are affiliated to some university.

Engineering Education system in affiliated colleges under university should follow the Outcome Based Education system as per NBA. Critical thinking and writing skills are required for every engineering graduate as per the one of twelve graduate attributes of NBA.

Students have many learning styles like seeing and hearing; reflecting and acting; reasoning logically and intuitively; memorizing and visualizing and drawing analogies and building mathematical models[3,6,7];

Teaching methods also vary. Some instructors lecture, others demonstrate or discuss; some focus on principles and others on applications; some emphasize memory and others understanding. Delivery of content in the classroom depends on the preparation of the student and by the compatibility of their learning style with that of the instructor's teaching style.

There may be a mismatch between the learning style of the students and teaching style of the instructor. As a consequence, students feel bored listening to lectures and soon start missing classes. The curriculum is so rigid they cannot choose courses of interest, they either lose confidence due to low grades or worse get completely disengaged with the major. Instructors on the other hand have very little control to be creative and thus may blame the students for being disinterested [1]. Thus the educational outcomes for the students are not being met.

The students graduate with a degree but do not have the appropriate employment skills. The recruiters of companies constantly complain about how students lack the required skills. There is a great need to bridge this gap between the requirements of the industry and the actual skills possessed by a student.

One way to address this issue could be to change the approach towards engaging the students to learn. Instructors need to find more innovative ways to involve students in subject discussions other than class rooms. This platform should be easily accessible and enable students to express opinions/ query without the fear of being ridiculed or punished.

Blog is an informational site on Internet which contains posts in chronological order[4]. Weblogs are easy to setup and administrate than other technologies. The blogs are accessible 24/7(anytime, anywhere) with a mobile device/computer and an internet connection. Discussions on weblogs involve posting comments or questions from users (students). The creator (instructor) has administrative rights that involve creating posts, posting/editing the comments and uploading multimedia content. **Collaborative weblogs** support team work and group learning. Weblog encourages informal communication, creativity and self expression. The act of posting questions/comments is termed as blogging[8].

Web blog is a tool that can be used to involve the students in active discussions in an anonymous manner without face-to-face interaction. Thus blogging can be used to enhance teaching and learning experience in conjunction with traditional lectures. Educational blog may help meet the global demands of engineering professional skills like critical thinking and writing. The information provided by the analysis of the weblog development may be used by the academic institution to carry out a SWOT (strengths, weaknesses, opportunities and threats) analysis of the teaching-learning process.

II. EVALUATION OF BLOGS AS TEACHING TOOL

We evaluated the usefulness of blogs among students using surveys. This activity was divided into two phases. One survey (Phase I) was conducted before the blogging activity and another survey (Phase II) was conducted after the blogging activity. In phase I, the blog was used as a passive learning tool and in phase II, it was used as an active learning tool. The first survey was also used to evaluate the usability of blogs among the students and their attitude towards blogging as a learning tool. Network

traffic analytics provided by the wordpress.com website regarding the visits and number of visitors was used to observe the patterns of blog usage.

A. Phase I (Passive Learning)

An educational blog was created for a subject as a part of coursework for engineering students. The wordpress.com was used as a host provider for the blog. The educational blog site information was made available only to the students and it was not indexed by any search engines to minimize other network traffic.

The blog site was used to provide resource material for that subject such as lecture slides, syllabus, question banks, useful links etc.

Table 1: Yearly Views/Visitors of Engineering Students

Subject	Month	Views	Visitors	Views/visitor
AI(PG)	Sep-13	70	20	3.50
	Oct-13	164	54	3.04
	Nov-13	40	21	1.90
	Dec-13	232	69	3.36
	Jan-14	51	21	2.43
	total	557	185	2.85
OOSE(PG)	Sep-13	96	28	3.43
	Oct-13	158	43	3.67
	Nov-13	30	15	2.00
	Dec-13	181	47	3.85
		465	133	3.24
OOSE(PG)	Jan-13	359	102	3.52
	Feb-13	121	85	1.42
	Mar-13	202	94	2.15
	Apr-13	103	50	2.06
	Total	785	331	2.29
NS (PG)	Jan-14	9	2	4.50
	Feb-14	16	9	1.78
	Mar-14	204	55	3.71
	Apr-14	5	4	1.25
	May-14	707	90	7.86
	Total	941	160	3.82

The students views and visitor data was obtained from the wordpress.com analytics which automatically collects data that is summarized in Table 1. A **view** is counted when a visitor loads or reloads a page. A **visitor** is counted when a user or browser is seen for the first time in a given period (day, week, month). Table 1 shows the pattern of visits of students. The students seem to visit the website in large number just before internal and external examinations. This indicates the students seem use the web site material just before their examinations. Table 1 show there is a surge in network traffic to the website during October & December during internal examination for the subject AI & OOSE. These subjects are taught in same semester and internal examinations are just one day apart.

There is a strong need to engage the students continuously to learn during the course of study and not just before the examinations. Student surveys were conducted to gauge their opinion of the usefulness of blog and their interest to be engaged in learning using this platform. All students who responded agreed that they visited the blog site with a rating of 4.57 out of 5 on a Likert scale. They agreed that the blog site was useful for their internal examination (4.74 out of 5) and external examination (3.91 out of 5). The rating of usefulness of blog site for external examination is less compared to internal examinations may be because the external examination papers in affiliated

colleges are designed by the university and not by the course instructor.

B. Phase II (Active Learning)

The students had shown considerable interest in visiting the blog site as seen in Table 1 as shown in the **Visitors** column. Now that the students had warmed up to visit the blog site, we wanted to use this opportunity to gauge the attitude of students towards using blogs as a learning platform and also address the issue of engaging the students in active and collaborative learning rather than passive learning.

C. Method:

The group of 23 students of engineering enrolled in the network security class was selected for this purpose. The students were given two sets of questionnaire consisting of 6 questions each. Set I was given **before using the Blog**. The primary purpose of set I questionnaire was to determine if they actually visited the blog site and whether they found the material posted to be useful. A total of 23 students responded to the set I questionnaire.

The set II questionnaire was administered after the following activity: A regular lecture was conducted. The lecture lasted for fifty minutes on a topic relating to network security. Following that, a post with a figure and a question pertaining to that topic was created and the students were asked to anonymously discuss the topic in depth on blog at their convenience. They were given a couple of days to complete that task. The Questionnaire set 2 was administered after the students posted their comments on the class blog site.

A total of 18 students responded to the set 2 questionnaire. Each question in questionnaire was evaluated on a 5-Point Likert scale as shown in Figure X. The 5-point scale was then classified into 3 categories; 1-2 as disagree, 3 as neutral and 4-5 as agree since the sample size is small.

Sample : Set1

Instructions: Put a check mark in the square depending on degree of agreement or disagreement with the corresponding statement. One means strong disagreement and five means strong agreement

Questionnaire1 for Blog site

Statement	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
The blog exercise was useful learn about the topic has strengthened my knowledge					
Expressing					
I have learned about the topic by writing about it on the blog					

Suggestions/Comments on improving blog site: _____

III. ANALYSIS

Figure 1: shows Question 5, of set I & set II. It concerns with whether the students are willing to read and post the comments on blog. Thirteen (13) students agreed, 7 were neutral and 3 disagreed before blogging. The same question was repeated in set II. Seventeen (17) students agreed and 1 was neutral on the willingness to read and post on blogs. The number of students who agreed to post comments on blog increased from thirteen to seventeen after blogging.

This shows that students are willing to adopt blogging as a new way to engage in learning process.

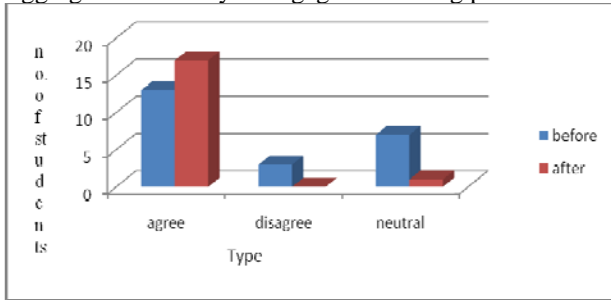


Fig. 1-students replied to this question, " I would be willing to post comments and read comments about academic topics posted on blog site to enhance my knowledge about any subject".

Generally speaking, many students don't often ask questions or comment about a lecture in classroom. This may be due to fear of being judge or ridiculed by peers or instructors. Blogs can provide a way to post comments in an anonymous manner. The students do not have to register or provide any kind of identification information to post on a blog. This, we believe may lessen their fear of expressing their opinion compared to class room. Thus, the ease of expressing the opinions of students on blog compared to that of classroom was queried. Figure 2 shows Question 2 of set II, the responses of students regarding the question of whether expressing their opinion on the blog was easier than in classroom. Majority of the students agreed that expressing opinion about topic on blog was easier when compared to classroom.

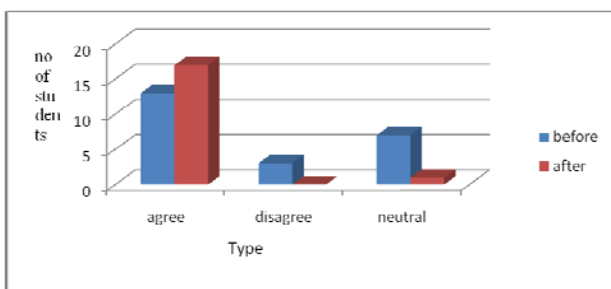


Fig. 2: The response of students to the question, " Expressing my opinion about the topic on the blog was easier than expressing the same in classroom"

Question number 6 of set II, queried whether they would recommend blog as a platform for improving their participation in discussions. All students who responded (18) positively agreed that they in fact would recommend blogs as an alternate platform shows in Fig 3. It helps to improve the critical thinking. Average level students required some time to understand and apply the logic. They may create their own idea.

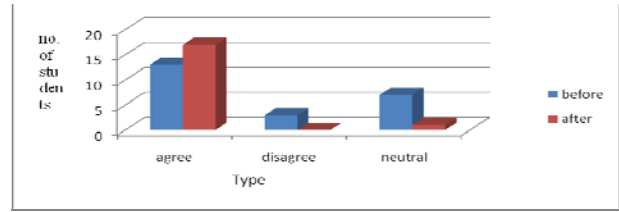


Fig.3 The response of students to the question, " I would recommend blogs as one of platforms that may be used to improve student participation in discussions other than inside classrooms"

IV. CONCLUSIONS

In this paper, blogs were used as a platform to implement an alternative way to engage students other than classrooms. We found it to be very promising especially in typically Indian education system in an affiliated college.

The group of students surveyed was very enthusiastic about blogging and almost unanimously agreed to recommend this platform as an alternative way to engage them in class room learning. The sample size is small to make any reasonable conclusion. In the near future, we would like to consolidate our preliminary finding by conducting studies using larger sample data. One other major challenge is that of motivating the students to blog. Giving credit (marks) is the best way to motive them but there are some programmes, especially the M.Tech./M.E. that do not give any leverage to instructors to give credit to the students other than the internal examinations.

We believe that this platform will supplement the classroom lectures to enthuse students to apply their critical thinking skills and enable peer-to-peer learning through collaboration. We conclude that blog is a useful platform to enhance the students learning process in engineering education.

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