

Tech-Integrated Engineering Curriculum using iMac Lab

Neha Singh¹, Nisha Verghese², Sinu Mathew³, Neha Kunte⁴

^{1,2,2,4}(Assistant Professor, Computer, Atharva College of Engineering/Mumbai University, India)

Abstract: Unlike the past times, Technology has its place in education, a major role in transforming the lives of the students and furnishing and grooming them to face the challenges in the outside world. It is important to go further and beyond the syllabus and acquire technical skills to apply our theory based knowledge. Thus, Atharva college of Engineering at Mumbai is committed to turn this into reality, by sowing the seeds of awareness by means of orientations, and later watering the budding seeds to grow them into saplings by means of organising technical workshops, which in turn keeps them updated with the latest technologies. ACE has been ambitious and also tried innovative ways to make learning interesting and to induce the thirst for learning more and more. College has a mixed cauldron of projects which has not only earned fame and recognition but also helped students to establish a concrete base for learning and experimentation. As a part of these innovation trends, our college has set-up a state-of-the art iMac Lab consisting of 20 iMacs, an iPad and an Apple TV. The Mac operating system has many eye popping features and along with its high security feature, it had taken over the majority of the market share.

Key words: Atharva college of Engineering, orientations, iMac Lab, Mac operating system.

I. Introduction

There is a need to change and adapt to modern Engineering practices in order to compete with Global Market. For this to happen the old has to go and give way for the new. As per the recent research, it was observed that a lot has been discussed on what is to be changed in education system and very few have thrown light on the problem of how to implement the same. Hence, in many colleges, as an outcome of this research, steps are taken to achieve new and higher standards in teaching and learning. With increasing number of smart classrooms, it has been noted that infrastructural support for academic development has been meticulously planned, however there is very little focus on pedagogy of engineering curriculum.

As we are progressing from a push button age to a touch screen age, we need to identify those technologies which would benefit the students in their growth and development, and accordingly providing training and orientation sessions to extract the experts out of them.

II. Literature Survey

Sinu Mathew [1] in her paper pointed out the importance of creating awareness in students about the importance of innovations, and staying updated with technologies. Results of an opinion survey with sample of students about sense of satisfaction was carried out and presented in the paper with statistical analysis[1].

Deborah N. Huntzinger [2] presents the need of immediate change on the approach towards engineering education which is mostly confined to completing curriculum in traditional methods. Further the author emphasises that mere knowledge base is not sufficient for them to come up with appropriate solutions. They require adequate guidance that will lead them to intellectual development and they also need to understand the effect of their resolves. For the environment to be learner-centric, it is proved that the importance given to practicals, hands-on sessions and projects pays off more than the conventional approaches [2].

Graham. R's international study [3] on how the engineering education needs to be transfigured, and his further assertion on achieving change, has wide relevance. The perpetual challenge for most engineering education setups is to refrain from adding more material into the degree programs, and rather give importance on giving the range of feasible graduate outcomes. Incorporating technology into the existing system and giving more importance to practicals and hands-on sessions will help students to expand their thought horizons to come up with creative engineering solutions [3].

The purpose of the study done by Cristina[4] in her was to understand the notions of engineering students on engineering education. The results showed that students strongly insisted the significance of their own place in the engineering educational system. It further stated the value of instructional technology and real work examples in boosting the quality of engineering education.

III. Objective

The main aim for this research is to identify and to perform impact analysis of inclusion of extra-curricular activity in terms of avant-grade technology so as to prepare them in updating themselves to cope with the fast developing tech world.

IV. Trainings And Workshops

4.1. Trainings

Utilisation of iMac Lab:

In iMac lab we conduct weekly training on the Basics of iMac & iOS App Development. Under the guidance of Dr. S.P.Kallurkar, plan was made to open the iMac Lab for a five day training to all the students of the college in batches based on the enrolment. The registration and formation of batches for the iMac Weekly training is done through Dashboard . he dashboard is created by iMac student coordinators and maintained by them only.

(URL:<http://www.codestrike.in/dashboard/login.php>).

Every week 2 batches of 20 students each with preference to final year & third year students. The duration of the course is 10 hrs in a week which also including 1 hour test. To conduct the test we are utilising LMS called COURSE NETWORKING. We create the quizzes for every batch and conduct the test. The quiz contain 50 Multiple choice questions. We also provide certificates to the students if they have 100 % attendance & a minimum of 40 % marks in the test. After training we also take feedback for the training so that we can improve in future.

Schedule and Topics in Training : The training at iMac lab is conducted for 2 to 3 hrs for five day. On the first day a gist of iMac is given as usually students use windows system. Various iMac applications and its unique features are explained to the students. On the second day of training a hands-on is given on basics of swift using playground of Xcode. on the third day of training we start with making a simple application of iOS. Demonstration of Two to three simple apps are given to the students and then we tell them to design one simple app. on the fourth day we teach them how to make an application which consist more than one page i.e called Segue in iOS. On the last day of the training we explain them how to use the various components which are available in the object library of the Xcode. Below (Figure 1) is the precise table of the content coverage during the training.

Day- 1	Introduction to MAC, MAC vs Windows, Overview of Features & Apps, History of Mac OS, iWork- Pages, Keynote & Numbers iBook Author, iBooks, iTunes, iCloud, Keynote & Numbers iBook Author, iBooks, iTunes, iCloud.
Day -2	Basics of SWIFT Language.
Day -3	Working with XCODE & Basics of iOS App Development. Developing a 2 -3 simple apps.
Day -4	Developing segue app in XCODE.
Day -5	Developing application using various objects of xcode and one hour of test.

Figure 1: Topics covered in 5 day Training

On the last day of the training we conduct the quiz of 50 questions through LMS Course Networking. For every batch a quiz is posted on the iMAC_Training Group. Below (Figure 2) is the snapshot of the Quiz.

iMAC_QUIZ_BATCH-34
Created by: Isha Singh
Instructions: EACH QUESTION CARRY ONE MARKS. TIME: 40 MIN. MINIMUM PASSING MARKS: 20

1. Which controller is used to embed web content and enables navigation. Points: 1

☐ A. web controller
☐ B. web view controller
☐ C. view web controller
☐ D. web navigation controller

2. Fill in blank Points: 1
Fill in the blank to create a singleton object within the code

__weak controller:() __ __;
___.giveAText;
print('welcome to iMac!');

3. What's the result of the expression var1&&var2, if var1=true and var2=false? Points: 1

☐ A. true
☐ B. undefined

Figure 2: Snapshot of the quiz on Course Networking.

After the Training a feedback form is shared through Course Networking only. Below (Figure 3) is the snapshot of the Feedback form.

ATHARVA IMAC LAB - WEEKLY TRAINING FEEDBACK FORM

* Required

Feedback

Rate the following on a scale of 1-5 (1 being the lowest and 5 being the highest)

Overall quality of the training *

Poor 1 2 3 4 5 Excellent

Quality of training content *

Poor 1 2 3 4 5 Excellent

Training Coordination & Organisation *

Poor 1 2 3 4 5 Excellent

Training skill and competence of trainer *

Poor 1 2 3 4 5 Excellent

Guidance, individual attention and support by trainer *

Poor 1 2 3 4 5 Excellent

What did you like the best about the training?

Figure 3: Snapshot of feedback form

Training Statistics: Every semester we open the Registration process through Dashboard and then call them based on their registration. Below (Figure 4, Figure 5) is the statistics of the registration and trained students.

July 2015- April 2018	
No. of Students Registered	1382
No. of Students Trained	869

Figure 4: Statistics of training



Figure 5: Graph of statistics

4.2. Workshops

Tracking the latest and explosive developments in the field of mobile application development, Atharva College of Engineering in collaboration with Academic Interface Program(AIP) team, TCS, Mumbai, organised a 5- day workshop on Swift programming (the coding language used for developing applications in iOS) and iOS App Development in March, 2015 at iMac Lab, Atharva college of Engineering.

Starting with the basics of SWIFT language, the 5 day training involved theory as well practical sessions, solving assignments and more importance was given to hands-on sessions. Not only that the feedback was positive but the students were also thankful for having given such an opportunity wherein they could go beyond the boundaries of their predefined syllabus.

4.3 Job benefit to the students

As this lab is established with a vision to make the students aware of the latest trends in the market so that it can help them to match with industry standards. After attending the training the students get an edge over others who have not undergone this training and hence we have calculated the Job benefit percentage.

Below are the statistics.(Figure 6 and Figure 7). The percentage is increasing every semester.

2017-18		
No of Students Placed (Till December 2017)	No of Placed Students completed iMac Training	Percentage of Job Benefit
112	62	55*
2016-17		
No of Students Placed	No of Placed Students completed iMac Training	Percentage of Job Benefit
230	155	67

Figure 6: Job Benefit statistics

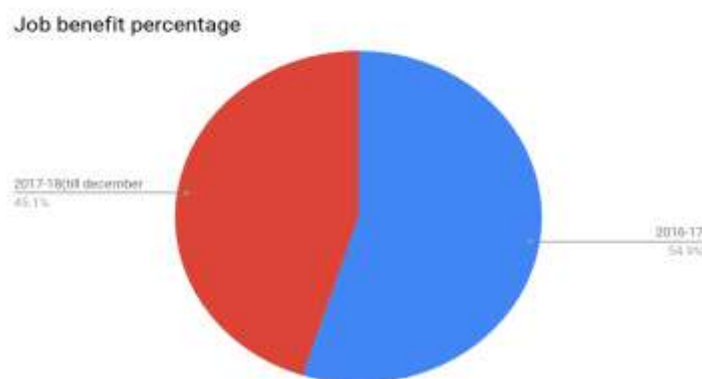


Figure 7: Pie chart of Job benefit

V. Results of Statistical Analysis

5.1. Faculty Orientation

There were representations from various departments of the college in this orientation session.

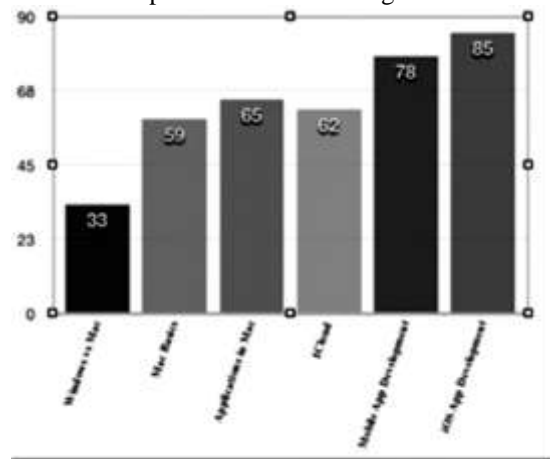


Figure 8. Orientation: Faculty satisfaction on various topics (in Percentage)

Most of them had high opinion of the session and commented that it had benefited them in many ways. The overall feedback was positive.

2. Student Orientation

The teachers who were trained in their faculty orientations shared what they had learnt with the students. Opinion surveys were taken periodically to assess the effectiveness of the Student Orientation Programme. Owing to the hands-on sessions and its practicality, its immediate effect could be easily noted by their enhanced productivity and increase in their desire to dive deeper into the respective fields and reap its benefits.

Orientation: Students satisfaction index in percentage

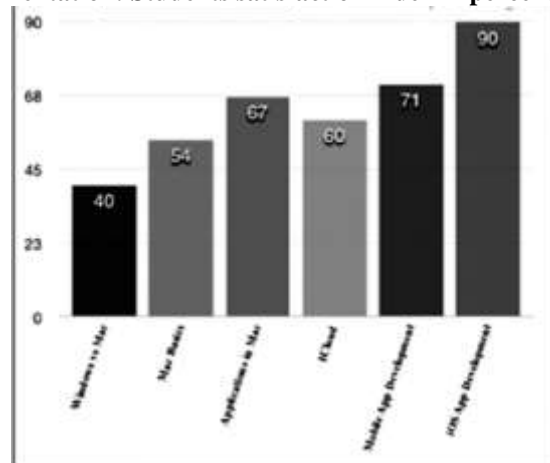


Figure 9. Workshop: Students' satisfaction on various topics (in Percentage)

They were amazed by the applications of Mac like iBook Author, the resources in iTunes-U, the power packed iWork (Pages, numbers and keynote) and the response for that session was very positive.

On successful completion of the orientation, feedback was taken from a sample of students on the topics of their interest. Mobile App development got an overwhelming response from the students as well as faculties which prompted us to conduct a session on the iOS App development by industry experts. The overall satisfaction percentage was above average.

VI. Discussion

The lab gave students the exposure to the opportunities in our institution. Irrespective of their background and their departments, the infrastructure coupled with tech aided learning proved to be beneficial to the young inquisitive minds. They are now updated with the latest technologies and also come forward specifying their further interest in many other fields like, networking, web services etc. thus helping them take wise decisions in choosing their career path.

VII. Conclusion

It was observed that the most of the students preferred extra curriculum to the theory based studies, as it gave them real world simulation of the challenges that they would face and at the same time put them in a better place and fully skill equipped in this competitive and ever demanding world. The overwhelming response of the students encouraged us to plan more workshops and trainings to be conducted in the future.

VIII. Limitations

Since the topic chosen here is domain- specific (Mac and iOS), the factors used to assess the sessions are also subjective and hence it cannot be expanded to other technological initiatives. In case of other technologies, other specific factors related to the domain needs to be taken account. Also the cost of setting up such a lab is relatively high.

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