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IT Enabled Teaching over Traditional Classroom Teaching

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Abstract: ***IT is penetrating into school education. Lots of companies are coming up with digital material for school students. Many are making specialized hardware to meet the requirements of elementary education system. Unfortunately these facilities are restricted to wards of upper middle class families and elite class. In past few years due to decrease in the price of computer hardware and other electronic gadgets, many educational institutes are opting for digital study material for their students. Organizations like Schoolnet, Tirumala Softwares, Educomp and many more are playing vital role in digital content development. Tremendous growth of such organizations shows that IT tools are useful in effective teaching. Now the question arises, is such tools beneficial to school students only? Can we make use of advance technology in teaching students of higher education? Current paper explores the use of innovative technology in higher education. We begin with the introduction to traditional teaching methods in higher education. We also explores the alternate method of learning followed by many students aka self learning, and tries to blend the best features of both i.e. traditional learning and self learning supplemented with innovative Technology for better learning of students.***

Keywords: Technology, Traditional, Innovative, Gadgets, Education.

I. Introduction

According to world banks report, India's higher education system is the second largest in the world, after the United States. We also have institutes like, the Indian Institutes of Technology (IITs), Indian Institutes of Management (IIMs), National Institute of Technology (NITs) and Jawaharlal Nehru University have been globally acclaimed for their standard of education. Still India has failed to produce world class universities like Harvard or Oxford. There might be several factors responsible for this, but the bottom line is all Indian Universities/Colleges which adds up to 33000, is not able to deliver quality education to all the students, or may be the more then 8 million students who are studying in Indian Universities/colleges, are not able to get acquire the desired level of knowledge. If we try to find out the reason for this, we might end up in a blame game, which is of no one's use at all. One reason that might be responsible for this is, most of the higher education institutions are following traditional learning model. This traditional learning model is failing to quench the thirst of many learners, who either end up with traditional degree in their hands with same traditional knowledge or gets motivated for self learning. The later search for various sources of knowledge outside traditional learning model and quench their thirst for knowledge.

II. Advantages of Traditional Learning

Teaching in a traditional schoolroom is vastly different from facilitating a virtual classroom. Classroom environments promote and stimulate a dynamic known as collaborative learning. Collaborative learning translates into a type of learning in which the pairing or grouping of students is required to complete a task or to come to a specific outcome. Teaching in a classroom gives students the opportunity to engage in live discussions in which they are forced to use their critical thinking skills to formulate opinions or arguments. When students are placed in a live classroom, they experience social interactions with peers and establish rapport with teachers. Helping children develop socially is an important aspect within the realm of their academic education. Classroom teaching environments help students figure out how to resolve conflicts, work in teams, get along with those from different cultural backgrounds and give presentations in front of peers. Such experiences are valuable in shaping students' communication and listening skills, as well as growing and maturing emotionally.

Teaching in a classroom environment opens up opportunities for teachers to do more with their lesson plans. Traditional classroom settings teach students how to develop organizational skills, beginning with the basics, such as arriving to school on time. In a live classroom, students are held accountable for being prepared to do school work, which includes having done their homework the night before, being ready for pop quizzes, turning in assignments by their due date and being prepared for in-class discussions.

III. Disadvantages of Traditional classroom teaching

A drawback of traditional training is that it inherently places the most value on standards, curriculum and passing tests as opposed to student-focused learning. Student-focused learning places value on the student and builds the curriculum around the questions young people need answered in order to understand the material. Constructivist learning builds on the knowledge students already have allowing them to form concrete associations to new information, which improves retention. Traditional learning is based on repetition and memorization of facts that students care less about and retain at lower rates after testing. Traditional classroom training doesn't encourage critical thinking skills, the ability to actively apply information gained through experience and reasoning. Instead, traditional training emphasizes the role of teachers as knowledge dispensers and students as repositories. This style of learning doesn't allow students deeper levels of understanding required for complex concepts and lifelong learning. Traditional training emphasizes passing tests, whether or not students under testing material. The learning process is thus devalued, and students are not encouraged to understand the methods, techniques and skills required to find answers. Traditional training emphasizes individual student work and projects and is poor preparation for a student's future endeavors, which are likely to include working on teams and collaborating with colleagues. Under this training model, students receive few opportunities to practice group dynamics and teamwork.

IV. IT Enabled Classrooms

Keeping in view the above advantages and disadvantages of traditional classroom teaching, where usually a lecture method is followed, in case of higher education. We can add some IT gadgets to the classroom. Projectors are already being used in classrooms for teaching. No doubt that this (projector) is an excellent IT gadget used in classroom, but our teachers as well as students failed to make optimum use and it is being used as a presentation tool only. With the passage of time many new gadgets are coming up to classrooms which includes laptops, Netbooks, smart phones and tablets. All these devices can be used in classroom for teaching purpose if planned properly. We had to set up the following infrastructure to set up a IT enabled classroom to teach some IT related subjects. A classroom with the capacity of 30 students was selected with following IT Gadgets

- 1 Standard Computer with Speakers
- 1 Multimedia Projector
- 1 Wi-Fi Router.

Following are some more electronic gadget proposed to be used in class.

Laptops

Laptop is the need of any engineering student. This is used by student to keep the records of all his notes and as internet is available in almost of the campus, students use Internet to complete their assignments. There are many eBooks available free of cost, students download such eBooks and study using laptops.

Netbooks

Netbooks are smaller laptops, usually 10” to 12” display with reasonable processor, memory and disk space can be used as laptops. This is the second type of electronic device preferred by students due to its cost, size and battery life.

Mobile Phones

Mobile Phones are usually not recommended in classroom and in most of the classrooms mobile phones are banned. But if monitored properly smart phones can be used a learning tool.

Tablet

Tablets are gaining popularity and with the regular advancement in technology the prices of such devices are coming down. Tablets are available in the price range of Rs 4000. Government has taken initiative by introducing Aakash tablet that perfectly suits the pocket of undergraduate students. One common feature that is required is Wi-Fi and almost all the tablets have inbuilt Wi-Fi adapter so that hey can communicate over local area network.

Ebook Readers

Ebook readers are small tablet like devices, which can display the content of eBook and can also be used to keep notes. Kindle from Amazon is the most popular eBook reader. Ebook readers also comes with Wi-Fi Connectivity

Setting up a IT enabled Classroom

We had set up the following infrastructure to set up a IT enabled classroom to teach some IT related subjects. A classroom with the capacity of 30 students was selected with following IT Gadgets

- 1 Standard Computer with Speakers
- 1 Multimedia Projector
- 1 Wi-Fi Router that can support up to 30 wireless connections

We installed Linux Mint 13 (Cinamonn 64 bit) and configured with following softwares/services.

- Apache2 (Web Server)
- Squid Proxy server
- Samba (file server)
- MySQL (Database Server)
- phpmyadmin

- LibreOffice
- Moodle (Learning Management System)
- Aptana3 Studio (IDE for programming)
- JDK
- Java Netbeans

This Computer system was connected to Wi-Fi router and projector. And we were ready with our IT enabled classroom, where teacher can teach with the help of presentations and can also demonstrate examples by running them on this computer. We selected those 30 students for our class who were having either of such electronic gadgets. Students were asked to bring their devices to classroom and first day with the help of IT technicians and lab-attendants. All devices are configure to use classroom Wi-Fi so that they can access the resources stored on our classroom server. Though there were more then 30 students having such devices, we had to select only 30 so that we can conduct the trial, we decided to select those students who were considered to be weak in class.

V. Planning for a IT enabled classroom

Teachers were asked to prepare presentations and add presentation notes. Prepare some relevant notes on topic. Teacher was also asked to prepare an assignment and quiz based on the topic and publishes it using Moodle. This took about a months time to plan the complete syllabus along with presentations and notes. EBooks were also downloaded from Internet and shared through this computer. Teachers were also motivated to download some relevant short videos from YouTube. To conduct a class 30 those students were selected who were considered weak in the subject. Students are advised to bring their laptops, net-books, Wi-Fi enabled smart-phones, tablets etc along with their notebooks. A teacher was advised to give 20 minutes presentation or lecture and then assign some assignment to students and observe the classroom and help them in case any student finds any difficulty.

VI. Conducting Classes

students were asked to configure their devices to connect to Wi-Fi router and configure their devices to use proxy server. (it was made compulsory for every one to use proxy server so that access to any unauthorized site can be controlled using proxy server) and server was configured to monitor to network access on all 30 mobile devices in the classroom. First day of our classroom was total chaos. After initial 20 minutes when students were assigned a task to find out what new in HTML 5, and other details about the concepts like markup language, tags, elements etc. we had to face difficulties in and it was about 5 instructors helping everyone to understand what to do. Many of us were also disappointed with such type of chaos in classroom. The morale of teachers was coming down with such type of response. Any how the first day got over. Second day before the lecture started, we observed that students were trying to take notes on their respective devices as well as on paper (according to their preference). We could see that some of the students were also accessing Internet and searching for more information and saving on their respective devices. This day was much relaxing as now students were acquainted with the organization of the content. We found some problems with 6 students only. These 6 students were those who were looking for more information while the presentation was going on. At the end of second day's session. We found that 10 students successfully completed their assignment while 13 had completed about 80 percent of work. We were thinking of taking feedback but plan was postponed for a week's time. Third day The Instructor announced that there is no need to search for additional information when the presentation is going on. Also the key points and slides of current presentation is available on local server which they can access later on. Everything went on smooth this day. Forth day thought that why not to offer student to run the presentation on their respective devices so that they can navigate the presentation if they feel to refer to previous slide they can do so. We had planned for test on fifth day. We had already set up a server where students can login and answer to the questions. The test was of MCQ (multiple choice questions) type. Total 30 questions were asked based on the concepts of HTML (The topic discussed through out week), for which total 30 minutes were given. It was open book test. They were free to surf Internet and refer to books if they need. All the questions were based on the understanding and application of the concepts discussed during previous sessions. It was quite motivating that 12 of students scored above 80 % and only one student was below 50 %. These were the same students who use to be between 40% to 60 % in their regular tests. This is how we successfully completed our first course on HTML using IT Enabled Classroom. After the successful completion of HTML we decided to experiment with subject that is not related to computers like this, therefore Discrete Math's was selected for second week. There was slight change in the way, the class was to be conducted. The time of presentation was increased from 20 to 30 so that teacher can demonstrate some examples before assigning questions to students. There was not much development in the first day. Students could solve only one or two questions out of 5 questions in next 30 minutes, rest of the questions were assigned as homework. Next day we observed some improvement in the attitude of the students. They were keen to solve the problems as many solved questions were available for their reference and the solution along with steps was available for many similar questions on our server. Similar to last week, on fifth day an open book test was conducted. Today it was only 20 questions which is to be answered in 30 minutes. The first remarkable thing that was observed that today everyone was sitting up to last minute. And second motivating thing that was observed that almost 27 students attempted over 15 questions and only 3 of them could answer from 12 to 15.

VII. Observations

During the 1 hour session the first part was usually silent but in self practice period there was lot of noise due to peer to peer discussions and teacher had to announce to keep the noise pollution under control. Secondly in case there are common doubts it was difficult for teacher to go to each individual and address their doubt. A kind of indiscipline was observed in classroom during session and for this reason only we had to employ more then one teacher. During some sessions we felt that organizing such type of classes is not feasible because, there was an expenditure of over 1 lakh per classroom (that includes the cost of computer, Wi-Fi router, projector and other installations). Also there are many students who are financially weak and can not afford expensive electronic gadget for such classes. The initiative by IIT Bombay in this regard is worth mentioning here as they are trying to develop low cost Aakash tablet which can be used in this process. It was observed that there was a remarkable improvement in the performance of students as those who were literally bottom liners (used to pass with grace, sometimes) successfully passed the test, off course not with flying colors, but with reasonable score. But this was restricted to those students who participated actively in self learning sessions and vigorously surfed Internet and our local resource repository for information and studied it. There were some students who were more interested in copying the content only, we could control this by motivating students to solve the assignment during class only and helping them doing so.

VIII. Conclusion

Today we need to create a perfect balance between quantity and quality of education. We can not expect educational authorities to cut down the syllabus so that student learns only, what he can understand, at the same time we need to make sure that whatever is being taught, must also be understood. The proposed technique of teaching with the help of ICT will surely increase the learning level of the student but we might end up in a situation where we could cover only half of the syllabus. Secondly setting up such infrastructure involves lot of expenditure on hardware (IT devices) as well as manpower, because we need to employ multiple people in a classroom. This approach might seem infeasible in some situation, but still we can not deny the output. Students learned better and shown remarkable improvement in their understanding. Leaving aside the financial aspect, we recommend that educational institutes must set up few IT Enabled classroom if they really want their students to be ready for competitive world ahead. Increased student satisfaction can lead to both increased faculty satisfaction and higher student retention.

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