

## Information Technology : A dominant player in the enhancement of Technical Education in India

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### *Abstract*

*In recent years, modern information technology has developed rapidly. The rapid development is found in computer, network and multimedia technology. The developments of these technologies are playing vital role in our day-to-day life but now the advanced technologies are increasingly important in the way of spreading knowledge. Information technology has impacted deeply to the traditional teaching concept, teaching content, teaching process and teaching resource and in technical education as well. India being a developing country with vision to become global power in 2020 finds the need of technical man-force as vital. The government is constantly striving for improvements in education system but much still remains to be done. At present scenario when there is inundation of advanced technology all over the globe we still lag behind on many fronts and this lagging is due to the lack of information and knowledge of teachers, students and the administration.*

*The goal of this paper is to delineate the challenges learning and how information technology can help to create an effective and efficient technical education.*

**Keywords:** *Technical education, Information Technology, Teaching methodology, Knowledge sharing, IT Tools*

### 1. INTRODUCTION

Technical Education is one of the most significant components of human resources development spectrum in improving the quality of life of the people. Due to its significant importance it

accords priority during planning and development. The history of inculcating formal technical education in India started in the 19th century although it got momentum in 20th century with the onset of Constitution of Technical Education Committee of Central Advisory Board of Education (CABE). Since independence the technical education sector has grown to present 222 degree and 203 diploma institutions from 4 degree and 8 diploma institutions in 1947. Teaching in engineering is largely done through lectures which have the platform of plain textbooks. Instructors need to direct student in learning activities and students practise by doing examples and by problem solving. This way of education is more passive and hence not very effective. The traditional concept of education with computers cannot reflect the influence of the information technology tools on education, and the integrations of the modern information technology and curriculum are opening up a brand-new research area. In this integration process, it is inevitable to introduce the advanced teaching idea, the new teaching goals and methods, evaluation measures for not only optimizing teaching environment but also greatly improving the teaching effect and the learning efficiency. At the same time, the traditional teacher-centred teaching mode in new situation is encountering the increasing challenges, so the teachers' role will also change in essence for adapting the development trend to integrate of the modern information technology and curriculum.

### 2. THE CONDUIT MODEL OF TEACHER-STUDENT KNOWLEDGE SHARING

The teacher and student play an important role in education. Teacher acts as a facility center of information and knowledge and student acts as a learner of information and knowledge. The teacher after gathering information from specified sources like text books, personal notes, library etc

communicates it to the students. Here communication plays a vital role in the delivery of information and knowledge from teacher to student. In this mode of information exchange the art of communication and lecture delivery plays a crucial role. With the very limited scope of gathering information and knowledge better education cannot be expected. The instructors and learners are facing individual challenges in the current education system.

### **A. Challenges from the student's perspective**

The students are facing the following problems in a technology less educational environment:-

- a) They are missing information.
- b) They do not know exactly what to learn.
- c) They go to classes and find teaching in air resulting in reduction in concentration in the classroom.

The net effect of traditional teaching is decrease in motivation level of the students.

### **B. Challenges from the teacher's perspective**

The teachers are facing the following problems in traditional educational environment:-

- a) They do not know what students are doing.
- b) They have difficulty with spreading information.
- c) They find it very difficult to reach to students.
- d) They are not updated or under-qualified.
- e) They are not acquainted with recent technical knowledge.
- f) Many are forced to use outdated material in the form of old books or handouts
- g) They have often complains of high work load.

Apart from the teachers and students a third dimension is also important to be considered. This dimension focus from the viewpoint of the administrator

### **C. Challenges from the management perspective**

The school administration is facing the following problems in technology less educational environment:

- a) The curriculum keeps pace with developments in the fields being taught.
- b) There do not appear to be any established principle on the timely revision of textbooks.

## **3. THE TEACHING LEARNING PROCESS REVOLUTIONIZE BY THE INFORMATION TECHNOLOGY**

The teaching methodology is drastically changed by the modern teaching aids of information technology. IT has not only modified classroom teaching but altered the teaching ideology, teaching content, teaching mode, teaching methods and teaching means, and made us confront with the unprecedented challenges in the teaching work. Technical education is revolutionized by IT is following ways.

### **A. Transformation in the Time and Space of teaching learning**

Modern information technology tools, especially the network technology, has triumphed the limit on the time and space in the learning environment. IT has converted the world into a global village thereby bringing education system at the door steps of the learners. Universities have the distance education programme very common which cannot sustain without the backbone of IT tools. The Radio and TV University and Internet, etc. are hitting the traditional school teaching mode, breaking the school fence, and making the range of the school more vast. The information superhighway has connected the school, family, society, library, scientific research institutions etc. Anyone can almost access any information anytime and anywhere from internet, and they can also exchange knowledge and ideas with each other even without meeting. The network education has extended beyond the boundaries of countries. Hence the teaching is no longer limited to the traditional internal school in time and space.

### **B. Transformation in the Teaching and Learning methodology**

The modern information technology has deeply and widely infused itself into teaching field. Traditional way of imparting knowledge via a "chalk-and-board" is reduced to a great extent. Also the cramming method of teaching as "teacher speaks, student listens; teacher writes, student copies" now appear obsolete. With the advent of IT very difficult concepts can now be understood easily with pictures, animations and videos. Apart from simplifying the concepts these methods provide a realistic perspective and better

environment of understanding and grasping various matters, thereby greatly increasing the quality and efficiency of the education system.

### C. Transformation in the teaching material

The teaching material what can be called as knowledge was available just a plain text book in the traditional teaching environment. In such books we find extensively simple two dimensional sketches of different objects and parts. The internal sections of the components are shown with sections and hatch lines. Hence understanding such object is part of pure imagination. The multimedia interactive textbooks, which integrate the text, graphics, animations and in some cases even audio and video, have now replaced the traditional static plane textbooks. These new text books have converted knowledge from static into dynamic and have considerably improved the teaching efficiency. Further, the teaching material is long-lasting, resilient and easy to carry. Therefore, the effective use of the products of information technology as multimedia teaching materials assists in effective students' learning and better way of knowledge sharing by the teachers.

### 4. BENEFITS OF IT BASED TECHNICAL EDUCATION

The benefits of IT in education system are enormous but few are listed below

1. Effective and efficient teaching methodology
2. Realistic view of the concepts
3. Far better understanding even of very complex concepts
4. No boundaries or limitations for the time and place of teaching learning
5. Capability to develop interest of learners in classroom
6. Capability of involving learners actively in learning
7. Adaptability
8. Develop curiosity and creativity among learners
9. High-order thinking and sound reasoning.
10. Help to increase competency of learners

### 5. TECHNICAL EDUCATION WITH AND WITHOUT IT TOOLS

Information technology has the capability to completely transform the education system into a

better, effective and efficient learning process. The comparison of education system with and without IT tools can be as follows.

Without IT tools	With IT tools
a. Learning is Passive.	a. Learning is Active.
b. Teaching is Formal.	b. Teaching is informal.
c. Dominated by teacher	c. Student requirement driven.
d. Constrained by time.	d. Not dependent on time.
e. Content identified by others.	e. Content defined for students.
f. Evaluation after distinct intervals	f. Understanding is judged continuously
g. Participation of learners cannot be ensured.	g. All students fully participate.

### 6. INFORMATION TECHNOLOGY TOOLS IN IMPARTING TECHNICAL EDUCATION

The following tools are useful in promoting information technology in the field of education:

#### A. e-Learning materials

Internet plays a major role in imparting technical education to learners. The huge amount of information and knowledge can be accessed from the internet with the tools like video conferencing, downloadable materials in pdfs, docs, ppts, e-journals, e-books and online training and certifications. Figure (1) depicts the use of internet for accessing information.

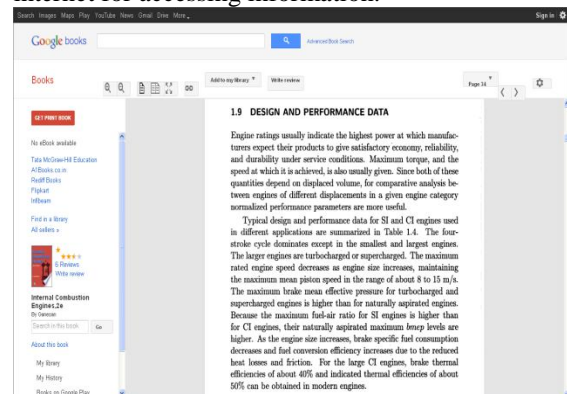
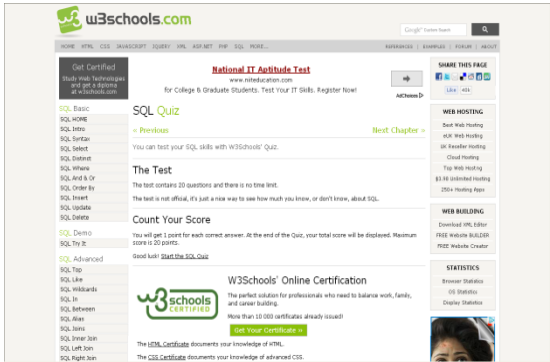


Figure (1) Use of internet for accessing book

**B. Online evaluation**

Information technology not only provides with huge content of knowledge but also can be used for testing knowledge gained by learners. Figure (2) is one of the method of online evaluation. The advantage of online evaluation is that the learners get the result immediately and also they can avail the facility of detail explanations of the question thereby increasing understanding.



**Figure (2) Online evaluation of knowledge**

**C) Offline teaching aids**

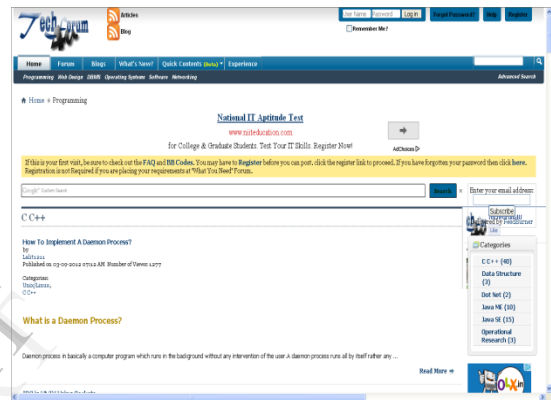
Information technology system can provide flexible ways of teaching students. Hence the learners can learn through offline content like CD's or DVD's and overcome the learning hurdles that make them difficult to attend regular classes or systemic pressure that have resulted from shortage of qualified teachers. Figure (3) shows a knowledge CD



**Figure (3) Knowledge in a CD**

**D. Technical forums**

With the advent of information technology the learners and even instructors can communicate with experts from particular fields. Figure (4) illustrates the use of IT for resolving queries. Here learners are not required to know mailing address or email id of the experts. Instead they are supposed to join the community of specific domain and post their queries, suggestions etc which can be accessed by all the members of the forum. With this method of information sharing we get a much better platform for knowledge exchange.



**Figure (4) Technical forums**

**CONCLUSION**

Engineering is the most important field of science which is dealing with our day to day life challenges. Teaching in engineering is largely done through lectures which have the platform of plain textbooks. Instructors need to direct student in learning activities and students practise by doing examples and by problem solving. This way of education is more passive and hence not very effective. IT has radically changed the world of engineering, and professional software tools, although they relieve users of some time-consuming tasks, also introduce others. Learning by using the IT tools provides and impressive method of dealing with engineering problems. IT tools not only provide an alternative to passive learning but also involve learners actively in the learning process thereby increasing the effectiveness and efficiency of learning. They provide a more realistic view of the very complex concepts for better understanding the problems. There are no boundaries or limitations for the time

and place of teaching learning and leaning with IT tools develop curiosity and creativity among learners, generate high-order thinking and sound reasoning thereby helping to increase competency of learners. IT tools allow us to learn without teachers. Thus we need to remember that information technology in technical education help learners achieve a high level of competency and competitiveness, and for understands engineering we have no choice but to make technology an integrated tool in the field of technical education.

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