

USE OF ADVANCED AIDS AND TOOLS FOR LEARNING PROCESSES FOR ENGINEERING STUDENTS

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Abstract

Learning is a continuous process for every human being. There are many developments in learning processes of students till ancient period to modern educational system. Ancient educational methods based on books and remembrance. Students were sent to Ashram and Guru was preaching all kinds of education and knowledge. In the next eras, the new methods developed. For so many years, the teachers used the black and white methods. Recent educational system has become global as the world is coming near due to internet. The present research paper is illuminated on the advanced learning tools for engineering students. Various charts, models, PPTs, etc. are found effective teaching tools now a days. Different types of online software's, audio, visual, audio-visual tools can be used for effective teaching-learning process. In various engineering institutes, for improvement of English communication of students, English language lab is proved the helpful and most effective tool.

Key Words: *Learning methods, tools, internet, education, engineers etc.*

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To be educated is a prestigious thing, which decides anybody's status in the society. Education plays vital role in human beings. The purpose of education is to develop persons' thinking ability to think critically as well as logically. Education develops the character of humans. The talent and personality co-works in fulfilling the goal of a person. Education is the sharpest weapon to use in illiterate society. Only through this weapon, anybody can change the world. It is the door of heaven where everyone can get what he or she want. Learning is the indication of change, and change indicates the future progress. Future is based on present learning. The paths are difficult but the results are sweet. Education is a continuous process of learning. Education never stops. From the moment of person's birth, till end, they can learn new things for the betterment of life, society and country. It starts with school, and teacher plays very crucial role in the development of students. The impact of good teachers remains forever on the students. From the ancient periods, we are listening the stories of guru-shishya. Dronacharya and Eklavya's story is the most inspirational to today's generation. As the sayings-The whole purpose of education is to turn mirrors into windows, is absolutely true.

The present research paper illuminates some modern tools and learning methods for the engineering students. There are many developments in learning processes of students till ancient period to modern educational system. Ancient educational methods based on books and remembrance. Students were sent to Ashram and Guru was preaching all kinds of education and knowledge. In the next eras, the new methods developed. For so many years, the teachers used the black and white methods. Recent educational system has become global as the world is coming near due to internet and digitalization. Dr. Damodharan and Mr. Rengarajan in their article *Innovative Methods of Teaching* mentions:

Education is an engine for the growth and progress of any society. It not only imparts knowledge, skills and inculcates values, but also is also responsible for building human capital, which breeds, drives and sets technological innovation and economic growth. In today's era, information and knowledge stand out as very important and critical input for growth and survival. Rather than looking at education simply as a means of achieving social upliftment, the society must view education also as an engine of advancement in an information era propelled by its wheels of knowledge and research leading to development.(2)

Education is the right track, which shows the correct way of survival to the mankind. The focus is on students. To make them literate should not be the only aim of teacher, but the students should achieve critical thinking and its uses at proper time. There are various ways of teaching methods. Methods should be memorable and understandable. The students should get advantage of learning the things. This process should be two way- sending and receiving information with positive feedback. A teacher should try his/her level best while giving information. This paper will highlight on the different learning processes of engineering students. Now-a-days many innovative methods have been accepted by teachers to develop practical knowledge, to build up authority, to encourage the endeavor of the students to achieve the ambitions for the development of the country. Various charts, models, PPTs, etc. are found effective teaching tools now a days. Different types of online software's, audios, visuals, audio-visual tools can be used for effective teaching-learning process. In various engineering institutes, for improvement of English communication of students, English language lab is proved to be the helpful and most effective tool.

Advance aids and tools:

Education has a multi-dimensional purpose. It has teaching-learning process with feedback. There are various tools for educating students. As the world is approaching towards technology, these scientific and technological developments are used in education. It becomes necessary part of our daily life. We cannot imagine a single moment without technology. It is available on our single finger. Multimedia plays important role in this. Use of Information and Communication Technology plays important role in educational curriculum. The global scenario has changed due the use of E-learning in higher education. Paulsen defines e-learning as:

Electronic learning or E-Learning is interactive learning in which the learning content is available online and provides automatic feedback to the student's learning activities.(2)

Engineers take technical education. There are many branches of engineering. Every branch has its own specification. Students learn their respective subjects and get the knowledge from modern available sources. They learn through digital learning, computer aided education, problem-based learning, virtual classrooms, projectors, charts, engineering models, projects, practicals, online lectures, e-learning, video conference lectures, online tests etc. If teachers use such types of learning methods, it gives more attentive nature and practical awareness to the students. It gives positive experiences and knowledge to the learners. In addition, these things give the constructive and practically applicable results. Following are some learning tools.

Active learning: This method is a direct teaching method to involve the students in learning procedure. There are different ways of active learning such as technology based learning, team work, playing different activity, OHP, transparencies etc. The student's role is major in active listening compare to teacher. In classrooms, students are engaged with active learning because they have to response question-answer session rather than only sitting and listening calmly. In

active learning, they have to participate in different activities. On the spot assignments, writing gives scope to their imagination and critical thinking. Following are the characteristics of active learning.

- 1) Giving small presentation on learned topic boosts the students.
- 2) Presentation increases confidence regarding subject.
- 3) Interactive sessions are more beneficial.
- 4) It promotes them to develop leadership qualities.

Different companies visit for campus selection. To fulfill the requirements of different companies, soft-skill and personality development training is given to the students. The students learn various English-speaking activities like role playing, group discussion, debate, extempore etc. Students learn from these different activities, which is useful for them to get good job at recruitment cell.

Language lab: Advance technologies are valuable in education. Learning English language through language lab is one of them. Language lab is the modern mean of teaching language. It is useful for the improvement in English communication of engineering students. The different softwares are available in the market with required study material. Audio-visual facility is available in such softwares. Student consoles are connected with teacher console. Students listen, learn and practice English words/sentences in their communication. They improve their pronunciation of English words through language lab. This is more advantageous in their recruitment in various industries.

Digital classroom learning: The days have gone when the students are engaged only in books, reading and writing, classrooms and teachers. But modern generation is blessed with digital classrooms and hi-tech learning. Teaching with technology is a new familiar concept everywhere. It is also called virtual classroom. According to the web definition:

A virtual classroom is an online learning environment. The environment can be web-based and accessed through a portal or software-based... Just like in a real-world classroom, a student in a virtual classroom participates in synchronous instruction, which means that the teacher and students are logged into the virtual learning environment at the same time. (Web)

In these classrooms, all modern teaching tools are available for the students. The most commonly used media is PPT. Learning through PPT is more effective than chalk and talk methods. The students are involved in live presentation with photos, diagrams and graphs with suitable information. They can memorize this for longer period. The place of regular classrooms has been taken by these smart digital classrooms. These classrooms are facilitating with audio-visual system, big screen videos and animated pictures of the subject content, which has long lasting effects on the students. It creates the curiosity of learners to learn the things sincerely. Following are the characteristics of digital classrooms-

- 1) Less paper work.
- 2) It can be used anywhere as used through internet.
- 3) Teacher can carry anywhere.(where internet access is available)

- 4) Assignments can be submitted online even teacher-student can chat online
- 5) Moodle service is available for circulating notes to the students and create learning environment between teacher-student.
- 6) Video tutorials (online lectures) are useful to enhance student's knowledge.
- 7) Use of own prepared PPTs on the selected topic.
- 8) Online courses are available.

The resources are easily available on internet. Through Google search engine, many websites with lots of materials are obtainable. Also parent are informed time to time about the performance of their wards through SMS, mail or online. This is helpful in improving the performance of the students. In the education field, it is very tough to go without digitalization.

Project based learning: In project-based learning, students work in groups to solve challenging problems that are open-ended, curriculum based and sometimes interdisciplinary. At first, students decide how to approach a problem and look for a solution based on their prior knowledge. Teaching is considered as an input directing the learning process. Students gather information from various sources and synthesise, analyse and derive knowledge from it.

The main feature of a project is to make the learning environment student centered. Teamwork is a way to construct knowledge. In each and every project, students develop different skills. Projects help to learn the things in own way. These projects are the necessary data of the students what they learnt. It gives scope to their imagination. They can use their technical knowledge with creative ideas. Projects enrich to develop advanced technologies. Careful and proper selection of project creates good impact in their career. They have to write their ideas in descriptive manner. It gives opportunities to make research and find conclusion.

In general, it is an approach reflects the professional behaviour of the engineering discipline. Engineering students require the opportunity to apply their knowledge to solve the design solutions through project based learning rather than problem solving activities which do not provide a real outcome for evaluation.

Principles of project based learning is as follows-

- 1) Students work together in groups and collaborate on project activities.
- 2) A real world problem that affects the life of students is presented for investigation.
- 3) Students discuss findings and consult the teacher for guidance, input and feedback.
- 4) The maturity level of student's skills determines the degree of guidance provided by teacher.
- 5) Final products resulting from project-based learning can be shared with community, thus fostering ownership and responsible citizenship in dealing and addressing real work problems.

Problem based learning: It includes solving the real problems with the help of theory, which makes easy understanding. This method is learner centered. Students acquire content knowledge and skills.

Following is the role of students in problem-based learning.

- 1) Confront the problems.

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- 2) Need to know.
- 3) Define a problem.
- 4) Design a plan to solve the problems.
- 5) Gather information.
- 6) Construct potential solution.

Problem based learning fosters lifelong learners and life-long learners make good citizens.

Charts and working models: Engineering education is nothing without charts and working models. Near about all subjects need charts and models. Charts are used to clarify the doubts. It can be easily visible and can be read quickly. Generally, humans can remember pictures faster than the text. Charts transmit the message very fast and accurately. It plays important role in learning the things for engineers. There are various charts like bar chart, histogram, pie chart, line chart, tree chart, cartogram etc. are useful sources of learning.

Model making competitions: In engineering study, models are existing part. Modeling methods are used to develop creativity and promote research activities in engineering students. Students learn to design models, instruments, various machine and structure parts. Different competitions are held at national and international levels where these models are presented by the students. In that, Tech-fest robot making, Efficyle, Modra gives inspiration to learn and make new things. The ranks and prizes are given to motivate students' skills.

Overall conclusion is that the students should take advantage of modern tools in their learning processes as these are very much effective. These learned materials can be used to make their future bright and career oriented. Also, majority of these tools are students centric as there is cent percent involvement of students while using these tools. As students of their own handle these tools with the help of teachers, there is development in their thinking ability which is quite important in education system. The tools like problem based learning and project based learning develop the creativity, leadership qualities and social awareness among students.

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