Enhancing Empirical approach in teaching-learning using ICT

1Dr.Vikrant Shaga, 2Sayyad S amee, 3Dr.Arif Mohammed, 4Dr.K. Vengatesan
Assistant Professor, Department of Master of Computer Application, MIT, Aurangabad
Assistant Professor, Department of Master of Computer Application, MIT, Aurangabad
Assistant Professor, Department of MIS, Dhofar University, Oman
Associate Professor, Department of Computer Engineering, Sanjivani College of Engineering, Kopargaon

Abstract:
In today’s world, Internet plays a significant role in connecting the people all over the globe. Especially, in modern software and mobile applications usage of internet is significantly high. It is also observe that evolvement of latest tools and technologies in upcoming applications leads to significant growth in almost every domain. Education domain comparatively considered as least utilizing ICT resources domain among all other domains. Traditional teaching-learning is losing its impact in present world due to the birth of emerging online and blended teaching learning processes. Using latest pedagogy, we have created a unique empirical suggestive model which will encourage the educationist, students, teachers and other learners working under teaching and education domain to enhance their practical skills by creating and using online educational resources using ICT tools. This model will definitely benefit not only to students but trainers or faculties for creating educational resources and for rapid evaluation.

Keywords:
ICT, pedagogy, blended teaching

Introduction:
The major objectives of educational institutes and universities are to provide a quality educational, good infrastructure, better perception of concept, quick learning mechanisms, e-learning environments, industry based syllabus contents, motivation for research, general problem solving techniques or solutions to society, cope up with latest technologies and so on[1]. In the present scenario, cost of internet connectivity decreases drastically due to which each member of the family advance towards high speed internet connections in their smart devices. Latest mobile apps with high speed internet connections have not only benefited to the commercial world but gradually it has a great impact on the educational world. It means ICT stepped into educational institutes with latest resources and framework models for teaching learning. According to various researchers and practitioner – “It’s a combination of software, hardware, internet and other network resources for the purpose of better perception of key concepts”. ICT provided the mean of converting physical classroom teaching to online teaching learning[2].

In education with the support of ICT the level and quality of teaching-learning increasing. Today the universities and colleges trying to tackle the needs of society, ready for future challenges, the advantages and use of new technologies[3]. In the recent decade there is a rapid change in the field of Information and communication technologies (ICT). Due to the invent of new technologies peoples and students are surrounded with digital devices and they are using internet based applications from there smart phones. Now a day’s students need and preferences have changed, our traditional teaching-learning methods have some limitations and restrictions. We cannot restrict the students to seat in the lecture room and learn, they can learn by their own with experiments, prefer work in team, audio-visual sources, videos, quiz, discussion forum etc. In
this paper we are trying to enhance empirical approach in teaching-learning using ICT. From our given model students and teachers can get major advantages of their digital devices and smartphones[4]. According to students need and preferences we can provide the proper input through our model with courses, problem statement, online videos, quiz, assignment question, discussion forum etc.

In our gnomio application we created the users of the students and given the username and password to all the students. Whenever the students wants to access the course or any kind of activity wanted to do, they have to login until and unless they cannot access the course.

**Approach:**

In present scenario, students are not taking interest in executing list of practical by referring detail lab manuals in labs for a specific practical subject. Executing practical without understanding key concepts and problem statement affects the student skills in the real time working environment. So, after observing drawbacks of traditional teaching learning in labs, we came to the conclusion that we'll design online educational resources (OER) instead of lab manuals initially for one subject (say ASP.NET). After using this OER, learner will be able to analyze the problem statement and expected output for a specific practical. (Here, understanding of students clear about what they have to perform in the lab), Learn by watching the videos created by instructor and get prepared for the lab sessions for executing programs (visualize the actual demonstration), apply the knowledge to execute the practical, enhance their technical skills by attempting the activities in the form of quiz to get more knowledge about the same practical, communicate the issues/queries with instructor through discussion forum[2].

We have provided the model where student can think, perform and apply the same for real life problems. They can perform the practical(s) with ease and better understanding. To enhance technical skills, students will be motivated to use online tools to enhance their technical skills. He/she will be engaged throughout the session in performing single practical by referring our online resources. To promote team work and develop projects in a group, these resources will be

---

**Figure 1:** Suggestive ICT Model

We have provided the model where student can think, perform and apply the same for real life problems. They can perform the practical(s) with ease and better understanding. To enhance technical skills, students will be motivated to use online tools to enhance their technical skills. He/she will be engaged throughout the session in performing single practical by referring our online resources. To promote team work and develop projects in a group, these resources will be
really helpful if students went through all the practical(s) mentioned in the course from first to last. Everyone will respond in case of any query, issues in execution or understanding concepts. Students can interact through discussion forum for resolving each other’s issues.

**Pedagogic Decisions:**
For enhancing teaching-learning for practical based subjects, we have used the following pedagogic decisions for In-Class and Out-of-Class segment:

<table>
<thead>
<tr>
<th>Out-of-Class</th>
<th>In-Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Objectives of practical</td>
<td>• Execution (can be applied for real time project modules)</td>
</tr>
<tr>
<td>• Instructional Steps</td>
<td>• Quiz</td>
</tr>
<tr>
<td>• Expected Output</td>
<td>• Assignment</td>
</tr>
<tr>
<td>• Videos</td>
<td>• Discussion Forum</td>
</tr>
</tbody>
</table>

Table 1: pedagogic decisions for In-class and Out-class Activities

a. Cognitive Levels of Questions designed in the ASSIGNMENT Section. Learners can see the VIDEO and recall the code demonstrated. Apply the same code for real time projects.
b. Assessment Strategies – Code Execution (Based on internal defined rubrics), Multiple choice questions (Quiz)[2]

**Tools and Technologies used:**
While developing the Out-of-Class and In-class activities, the major technology decisions taken were tools to be used for creating screen cast – SCREENCAST-O-MATIC 2.0, as it had a time limit of 15 minutes and uploaded on YOUTUBE. In case, length of video is extending then, sequence of videos created and later on Merged with the help of MOVIEMAKER. For creating Learning by Doing Activities, Learning by Extension Resources and Learning Experience interactions resources, we have registered for the Online MOOC Application i.e. Moodle (gnomio) for setting up Out-of-Class segment [2].

**Best Practices for implementing lesson activity:**
Here are some of the best practices from our experience on using this Lesson Activity in classroom

![Figure 2: Best Practices](image-url)
Figure 3: Activities and Resources Used on gnomio [2]
Courses
For creating ICT model it is very important to choose a course. In our MOOC application there are 3 courses i) Advance Java ii) ASP.NET iii) Agile Methodology. These subjects are practical oriented and students prefer to create projects in it. Students are facing so many problems while creating a project, on the real time they have face problems like database connectivity, project execution and project deployment. So in our gnomio application with these subjects it elaborate course objective and course outcome. After selecting the courses all the activity with problem statement, online videos, Quiz, Assignment questions and discussion forum associated with these courses.

Course ASP.NET
Students want to know which and what is in course? So first of all we include the e-lab manual for given subject. It is the detail description of practical’s with the outputs. Student can easily view and download the lab manual from his/her login from anywhere and anytime. Students has no restriction, whenever it gets time he/she can download the material and study it. We can also include announcement regarding with the test or for important message. The following screen shot of gnomio tool shows Practical’s of ASP.NET. Each practical we try to organize in more understandable way, it contains problem statement and expected output, videos of the given practical, Assignment question, exercises, Discussion forum. Here students get detail idea about practicals.

Problem statement with expected output
For doing any kind of practical or project development . Students must knows the problem statement and its expected output. With the design of practicals firstly we gave the clear problem statement and its expected output. Here before implementation, students know what we have to perform? Following is the screen shot of problem statement.

Online videos
From the videos students gets clear step by step idea. We have stored the videos online on YouTube and given the related link in the respected practicals. After clicking on link it will redirect to youtube, so students can access the related videos whenever they want. The major bug came in the coding and configuration of projects. From our gnomio application students gets access the videos any time. So they can easily try to resolve the bugs.

Quizzes
In the teaching learning process teachers must know the understanding level of students and they should enjoy the teaching learning process for that quiz plays a very important role. In our gnomio application we have added the quiz of the given subject. Teacher can easily add the question and set the timing of the quiz after that it would activate in students login , student attempt the quiz in the given time. Its result displayed on the server side of teachers view, with the performance of the students the grades has been seen. We can view the grade either individually or once of all the students, the view also shown the detail information about the grade of students. It includes grade report, grade history, outcome report, overview report.

Assignment Questions
In the teaching learning process there is also a need of assignment questions; In the traditional learning process always the students forget about assignment questions, in our model we easily
add the questions of the given topic and they remains in the application. Whenever the students want they can view the questions and solve them.

**Online Survey Report**

One of the important activities in the model is online survey report. The purpose of this survey is to help us understand how well the online delivery of this unit enabled the students to learn. It include the 24 statements asks about students experience in this unit. There are no 'right' or 'wrong' answers; we are interested only in student’s opinion. The student’s response or feedback will be treated with high degree of confidentiality and it won’t affect their assessment. The students carefully responses will help to improve the way this unit is presented online in the future.

**Discussion Forum**

Discussion forum is a unique feature in our model. It is also important and interactive activity. It Will help information exchange and sharing in an interactive manner. It Encourages fresh ideas, innovative suggestions and thinking from wider sections of public . The platform is for open discussion and cannot be used for addressing individual problems, issues and grievances . Students are welcome to actively participate in discussion forum to share their thoughts, difficulties, problems, express their views, and silently watch what other talks.

**Conclusion**

It is observed in traditional teaching learning Students utmost don’t pay attention to instructors lecture. They assume that they have understood all the concepts by attending lectures. Few students who are toppers or high achievers are interacting with the instructors. For homework/assignments, some students find it boring and some students find it challenging. Many students copy the assignments from other students due to deadlines or exams.

Effectiveness at the student level involves metrics related to student access of the resource and student learning. As we have started this process of teaching learning with practical approach using our specified model, positive outcomes observed but still results expected in terms of frequency of student participants and their involvement in using online resources. Students gave feedback about the use of ICT in teaching learning is more useful and effective. In terms of reflective thinking, interpretation, relevance and tutor support, students finds it very important and best way of teaching learning. Our paper gives suggestive ICT model elaborate with course, problem statement with expected output, online videos, quiz, assignment questions, and discussion forum

**References:**


13) Taner Altun, Elif Bektas, (2010), Views of Regional Boarding School teachers about the use of ICT in education, Procedia Social and Behavioral Sciences 9, Elsevier publications, Pg No:462–467