Effectiveness of ICT Teaching Approach in Education Sector

R. Arulmurugan*

Abstract

The proposed article is to describe the various innovative approaches to the teaching-learning process using the Information Communication Technology (ICT) tool. The problems of the conventional teaching approach are identification of the students' learning level, improvement of critical thinking and interpersonal skills. The prime objective of this article is to establish how it can be overcomed by ICT tools-based learning approach. This article describes various innovative ICT approach methods used to enhance the students' learning outcome, assessing level of students' thinking, etc. The article describes the poll-based learning approach, automatic grade generated approach, mind-map approach, online quiz approach, virtual laboratory approach and brainstorm approach. This approach is used not only to identify students' level but also to generate the student's grade sheet, individual communication and maintain the assessment documents in a friendly manner.

Keywords: *Poll-based-learning Activity, Automatic Grade Sheet Generation, Result Analysis, Mind-map Activity*

Introduction

Information Communication Technology plays a vital role in engaging the students in learning mode continuously and interestingly (Ryan Legg et al. 2005). Information Communication Technology (ICT) helps to make students interested in recent day's online and offline classes (Bennett et al. 2017). Recent day's technology tools offer various teaching-learning approaches (Na J. Choi and

*Professor, Department of Elementary Education, Annasaheb Dange College of Engineering and Technology, Ashta, Maharashtra (email: arul.lect@gmail.com, ram_ele@adcet.in)

Harrison D. 2017). These tool-based-learning approaches attract the students to come to regular classes (Kleinsmann et al. 2017). Nowadays, lot of the ICT-based tools are offered in the online platform such as online classroom, online quiz interaction session, virtual practical sessions, brainstorm activity, poll activity, etc., in this article, detailed discussion on 'poll-based-learning activity' followed by 'automatic grade sheet generation and result analysis' and 'online mind-map activity'. This type of activity helps to recap the studied concept before six months of period (Kees Dorst and Isabelle Reymen, 2004). The poll-based learning and automatic result analysis activity are also most similar to the quiz oriented activity but is organised in different styles. The last one of the mind-map activity concepts uses to recap the content fast and understand the new concept in simplest manner (L. Thangmawia et al. 2022). In the next methodology session, detailed procedure and usefulness of these activities were described.

Information Communication Technology (ICT)-based learning tools are very helpful in educational programmes. Recent days' lot of ICT-based tools offer to enhance students' critical thinking level. The ICT tools are used to interact with the students through an online platform instead of conventional chalk and board, question and answer oral sessions. The same question and answer are conducted attractively in online platforms. In addition, it helps to generate the assessment at the end of each activity (Arnab Pan, 2022). These tools are used to monitor the students' performance time-to-time as well as the level of understanding topic wise or chapter wise. Virtual online classrooms in recent days are more famous due to COVID-19. A lot of free virtual classroom tools have been offered in recent days such as Google meet, zoom, webex, GoTo team, Microsoft team, etc. These online classroom tools are used to engage the class for weak students remotely after completing regular academics, conduct the mentee meeting and counselling activity, etc. Virtual laboratory online platform uses to conduct the practical course in the simplest manner. In recent days, IIT's developed more virtual laboratory-based courses, these courses show the video demonstration in the simplest manner. ICT tools play brainstorm activity. In addition, ICT tools generate the student's assessment. It will create a nice presentation result, with respect to various parameters of questions, student's depth, etc.

Methodology

This article explains numerous ICT-based learning approaches for enhancing students' creative thinking level. The approach such as poll-based learning activity, helps to find the students' learning outcome of the session, for example, at the end of the class, conduct five to ten questions through poll quiz method. Each end of the question easily finds the number of students answered correctly and number of students answered wrong, based on that easily estimated students' learning level. If necessary, revise the topic again to the students. The second innovative tool was automatic grade sheet generation and communication. This approach helps to generate the students' learning level plot automatically and it's a good approach to share the results to each student individually through mail. This mail shows what the correct answer is and what answer you responded, etc. The third innovative approach was mind-map activity, the mind-map helps to recap the concept after long days. In addition, the mind-map activity helps to interconnect the blocks. The fourth innovative method was ICT-based quiz activity. These quiz activities also generate the students' learning outcome plot at the end of the activity game. This quiz game helps to see the students' learning outcome, for example, how many students answer correctly and how many students are wrong on one particular question, etc. This helps to teach the concept again.

Poll-based Learning Activity

This section details a description of poll-based learning activity. The poll-based method is one of the simplest as well as interesting learning activities. These activities were conducted on Moodle platform. The following steps involved to perform the poll-based learning activity:

- Step 1: Instruct the students to join on an online Moodle platform.
- Step 2: The Moodle Bigblue online class interactive session has a 'White board' Screen method. In this screen type the question and related answer choices typed by teacher as shown in Figure 1.
- Step 3: There are options to conduct a poll. Instruct the student to answer the poll with option A to D.
- Step 4: Once completed the prescribed time, stop the poll to declare the student overall poll answer as shown in Figure 1.
- Step 5: Teacher start to discuss the answer of the question as shown in Figure 2. Declare the final result by tick mark on the polls as shown in Figure 3.

Figure 1: Organise the poll based learning activity

Figure 2: Declare the poll results and explain the concept

Figure 3: Discuss the correct answer and reason behind

Through, the activity not only engage the students in the classroom and also make them understand what is correct but why it is correct, where students are strong and weak, etc.

Automatic grade sheet communicating individually

Automatic grade sheet and result analysis generation. In recent days, the teaching faculty is facing a lot of clerical work due to a lot of accreditation bodies involved as well as outcome-based education expected assessment of each and every activity. These assessments are very much important to know the students' level of understanding but faculty face a lot of struggle to generate each and every result analysis of the clerical work. While preparing the 60+ students result analysis and grading sheet, there is possibility of error and mental work, on the other side, a lot of time is spent to prepare the format, etc., even the support of Microsoft Excel sheet facility and alignment of sheet, and generation of grade everything is needed to perform fast without mistakes. The automatic grade sheet generation concept helps to declare the grade in the confidential manner, and generate the result analysis in a neat model for maintaining the file and analysis for the next plan. The steps to generate the automatic grade sheet and communicate through private mail as detailed explanation is as follows:

- Step 1: Initially, faculty needs to create the quiz using the 'Google Form' for example, Quiz https://forms.gle/p5ZSedXdN4e8YkcW9
- Step 2: Instruct the student to perform the quiz in the Google Form.
- Step 3: Using Flubaroo add-on tools to generate the result automatically.
- Step 4: Install the add-ons and click to process the grade method. Initially upload the teacher answer key to compare the students' answer and generate the grade sheet. Figure 4 shows the students performing the quiz and the corresponding score was displayed in column 3.
- Step 5: Send the summary of grade score individually to all the participants as shown in Figure 5.

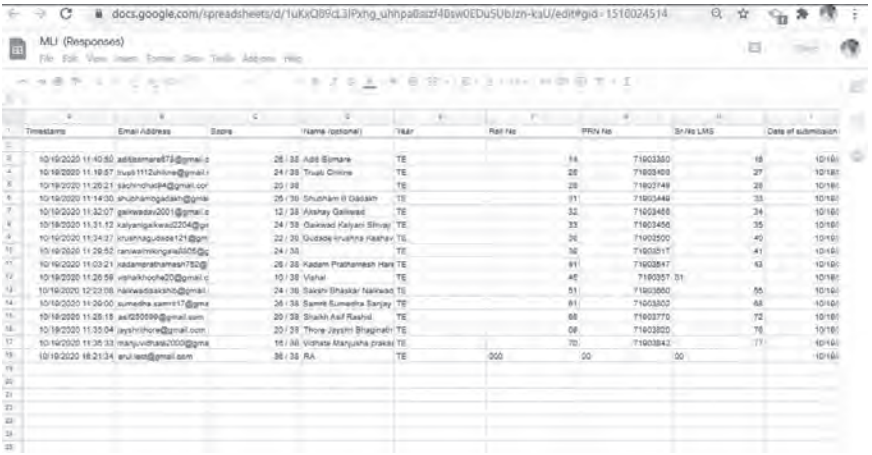

Figure 4: Score list of participants

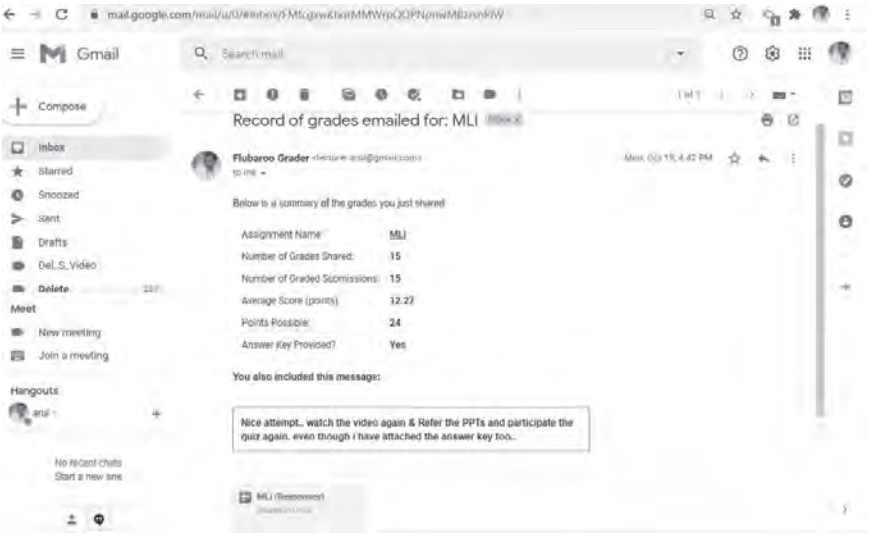

Figure 5: Grade details sent privately to each participant

Through this activity, result was generated automatically and shared students score in terms of number of grades shared, number graded submissions, average score, points possible and sharing the answer key, etc. Through the activity, students come to their level of performance and learn their mistakes with the help of the answer key.

Online Mind-map Activity

Online mind-map activity is one of the most interesting and important activities. This activity is used to recap the complete concept in a short interval of time. The pictorial way of representing this activity made it stronger for understanding the concept without support of any other documents. In recent days, a lot of ICT tools offer to perform the mind-map activity. This session on miro.com performed a mind-map activity sheet shown in Figure 6. The procedure to perform the activity as given below:

- Step 1: Teacher completes the chapter.
- Step 2: It will perform the activity individually and group. Instruct to do map on paper within the group followed by perform on step 3.
- Step 3: Once the paper is complete, ask to perform the same activity in miro.com.

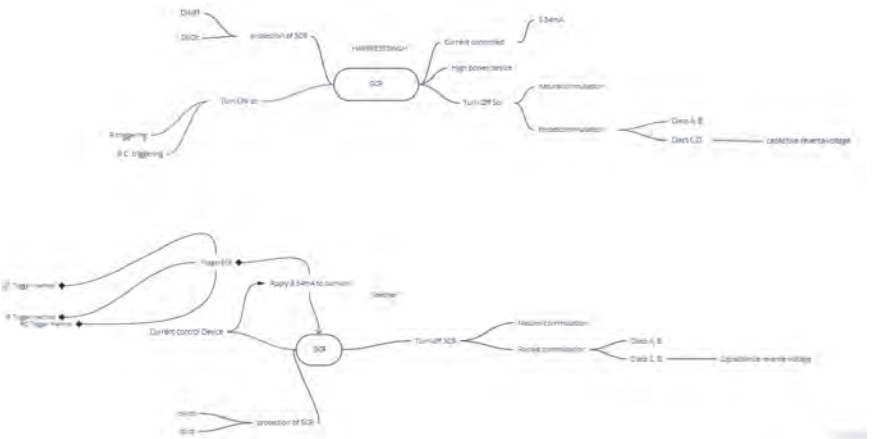

Figure 6: Online mind-map activity

Figure 6 shows the SCR topic activity after completing the chapter of power semi-conductor devices. Through the activity, students learn the power of understanding, remembering and applying to start to work fast, and link the pre-requisite and post-requisite of the topic. At the end of the activity, students go through their classmate's performance stage-by-stage to enhance their thinking level.

Online Quiz Interaction Session Using ICT Tool

The online quiz interactive session using Information Communication Technology tools is one of the prime tools to engage the students more actively in the classroom as well as motivate the students in terms of first, second and third prize. It is used to extract the assessment more easily. Through this activity, monitor the students' performance in terms of active involvement, those who are not in the active involvement as a teacher, instruct to participate in the activity. In this activity, play a music in back side, it is used to feel comfortable zone, while performing the activity by students. The procedure for performing the activity is, as follows:

- Step 1: Complete the particular portion before performing the activity.
- Step 2: Instruct the students early to prepare and practice the content of completions.
- Step 3: Prepare the quiz questions and answer, etc. This quiz performs automatically shuffle the questions and answer. So, I need not to worry about the malpractice issues.
- Step 4: Perform the activity in class. As a teacher, I opened the 'Quizizz.com' website. There is an option to generate the live quiz when the teacher presses the button to generate the 'Code' for joining the quiz.
- Step 5: Teacher instructs the students to join the quiz using code. Once all the students join the quiz, it may take two minutes and the teacher starts the quiz. Once the quiz is started, others can't join the quiz after that. Before joining the quiz, they are instructed to join with their roll number followed by name, so it is helpful to identify the student name and roll number in the easiest manner.
- Step 6: Students perform the quiz individually with the help of their smartphones.
- Step 7: Once the planned time has lapsed, the teacher needs to stop the quiz by pressing at the right side of the window to see the results.

Figure 7 shows the appearance of each question in the game. It is easy to select the answer out of the options, similar to multiple choice based. Figure 8 helps to monitor the student performance by the teacher, this window helps to identify the weak students.

Teachers need to go nearest to the student, start to encourage and find out the reason for lacking the performance in the quiz. In addition, who is performing good and bad in the activity, it will clearly show to the teacher and it will show the number of questions participated out of the total questions with respect to time, etc., it will show very clearly. This window helps the teacher to motivate and form a group for the next activity.

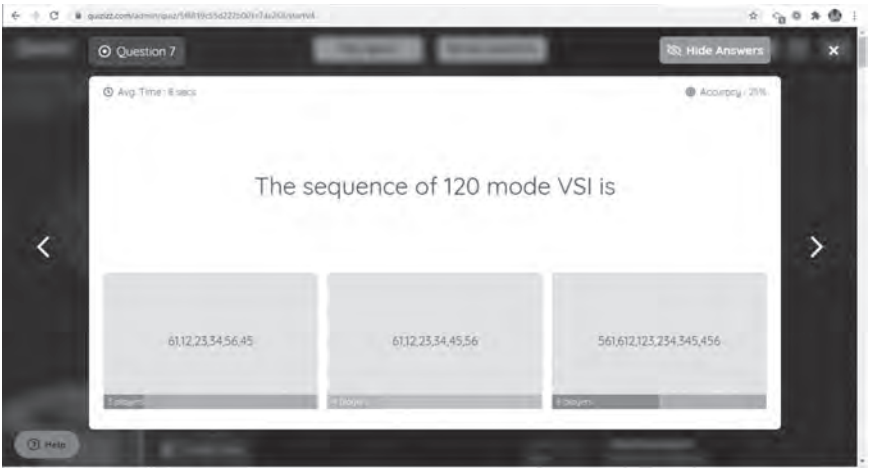

Figure 7: Appears of each question in student portal

Figure 8: Performance chart of live quiz

Once the decided time is over, click the end of the quiz at the top-right corner to stop the activity. It will show the rank of the first three students as shown in Figure 9. Appreciate the top-three scored students and motivate the next ranks students to come on end of this activity.

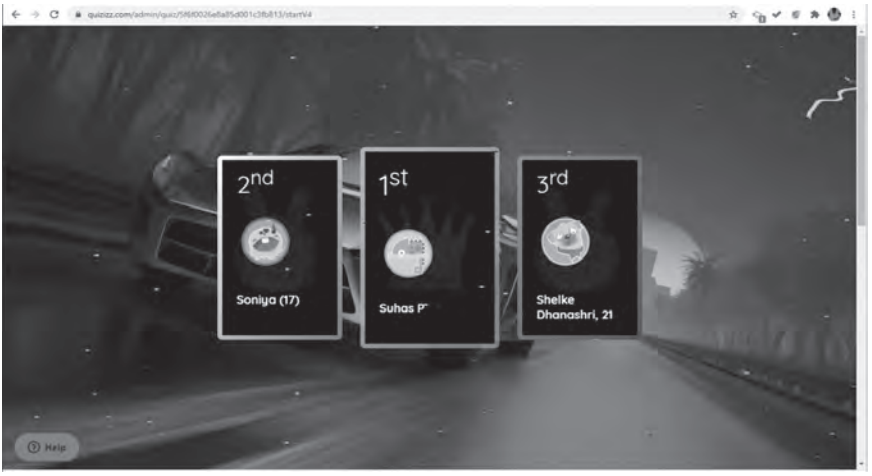

Figure 9: Rank list displayed

Figure 10 and Figure 11 shows the micro analysis of the assessment quiz. It helps to find the number of students wrongly performing in a particular area quiz easily. Based on the performance, explain the concept once again to the students to improve the performance on a particular topic.

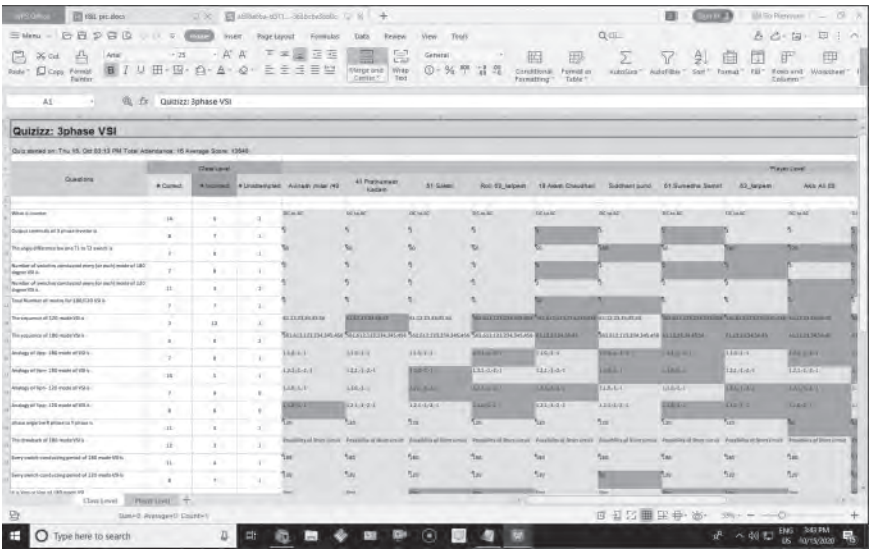

Figure 10: Assessment of students with respect to questions

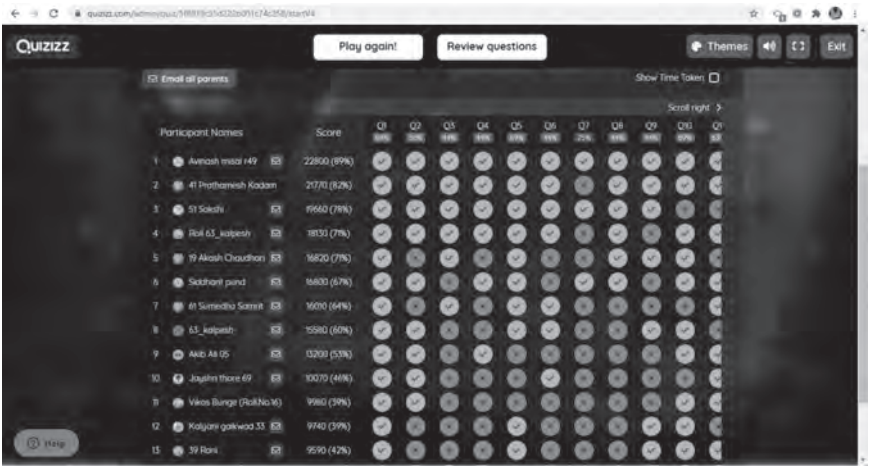

Figure 11: Performance of student's assessment

Figure 10 and Figure 11 shows the individual students' performance and individual question performance. It helps to enhance the student's level.

Research Recommendation

This article discussed the details, methods and procedures of various innovative ICT-based activities such as poll-based learning activity, which uses to evaluate the students depth of knowledge on the session. The Bigblue—white board uses to conduct these activity easily. Further, scope of this activity is to form the group members to conduct debate. The second one is automatic grad sheet communication. This activity helps to re-learn the mistakes. Further, scope of this activity is to give oral inputs to the students on the next day. It helps to recap the concept to entire students of the class and evaluate the students to re-learn. The third one described the online mind-map activity. This activity helps the students to link the studied content and easily recap the concept. Further, extended into asking the students to explain within the group. The fourth activity dealt with an online quiz interaction session. These online quizzes help to evaluate students' learning outcome individually. Further, extended into ask the students to write the mistake in their note, through that, students remember and re-learn the concept.

Conclusion

The proposed approach helps to solve the exciting conventional teaching approach problems of identification of students' learning level, students' thinking level, accessing student's grade, etc. Various innovative ICT-based learning approaches such as poll-based learning, automatic grad-sheet generation, mind-map approach, online quiz, virtual laboratory approach and brainstorm approach are discussed. These approaches reveal the learners' understanding level. The various ICT tools deliver complicated mathematical equations and concepts in the simplest manner. Moreover, the ICT tools are used to check the differences easily among various understanding levels of students. Students with different level of understanding can be assessed using ICT tools. This will help teachers to categorise the students into groups for organising group activities. These approaches are used to enhance the remembering and understanding level. Further, it improves students' level of thinking, remembering level into creative level by using a mind-map and brainstorm approach and communicating the students' performance results individually using an automatic grade system. The automatic grade system is used to extract and maintain the students' results in the easiest way. The poll-based-learning approach used to identify the whole strength, strong and weak area of the topics. Besides that, learners themselves enjoyed the ICT-based-teaching approach.

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