

ROLE OF ICT TOOLS IN ONLINE TEACHING LEARNING OF MATHEMATICS DURING COVID-19 PANDEMIC

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ABSTRACT

The objective of this paper is to share the experiences that I had about the role of the application of ICT tools in Mathematics teaching. As everyone know that Mathematics is known as the queen of all sciences. In previous days the role of mathematics was limited to only purely academic domain. But now a day, mathematics is not limited to the purely academic domain. It has made entry in the various fields of technology and industry. This paper will highlight the importance of the integration of Information and Communication Technologies (ICT) into the teaching and learning of mathematics in college level. During the pandemic, teachers as well as students were not mentally prepared for distance and online teaching learning. As need leads to discovery. This study is based on feedback collected from conversation with students and study secondary sources, like books, articles, journals, Teachers' feedback and websites, etc. Information Communication Technology (ICT) is an engine of research and innovation in field education, and has changed the role of information professionals and traditional library into digital library. After a deep study of these parameters we can conclude that ICT has changed the traditional style of teaching into a new pattern. But everyone has a different opinion about anything they may not be in favor of use of these new techniques.

Keywords: *Information and Communication Technologies, ICT Integration, ICT in Mathematics, Mathematical Education, Online Teaching Applications.*

Introduction

The study is especially crucial in under graduate Colleges because it presents a period of preparation for the students' future courses before making decisions about the students' future. Use of ICT is very essential in the situation created accidentally by pandemic COVID 19. As everyone knows that necessity leads to Discovery; it has solved a lot of problems. The crucial time of teaching to students in institutions in rural/remote areas who are not so equipped with latest technology is not a easy task. Mathematics as a science-based course or discipline is known as a queen of all subjects. Sometimes the teacher of mathematics does not have sufficient knowledge, but it is necessary to read into concepts that contradict what the theory of mathematics says or implies. However, mathematics is a unique subject or field, which encourages the gain of specialized science skills and knowledge, which helps to explain the natural phenomena of life in society. It originated from a practical problem and the men has always tried to solve these problems. Mathematics has contributed to the development and improvement of civilization and other disciplines and the development of culture. Despite the abstract nature of mathematics, its teaching is the scientific thinking among students;

ICT has become one of the primary building blocks of our modern society. This can solve the problem of low rate of education in a country also it can be utilized as a tool to overcome expenses, teacher shortages, as well as time and distance barriers, along with lower-level education. These possibilities of ICT integrate a proposed practice into the mathematics classroom. ICT in the classroom, especially in the incorporation of a positive outcome depend upon teachers' attitudes to the contribution of ICT for teaching mathematics and presence of ICT in the classroom or institution. In the contemporary era, education depends on the physical and technological improvement. Mathematics is considered a difficult question or boring subject. Mathematics theoretically provides a simple restoration of logical reasoning and knowledge. It makes it as a specific subject compared to others and shows an easy way to learn other things. Development is a continuous process, which is continuously underway. Providing and acquiring an education is one of the characteristics that set human beings apart from other living things. For advanced knowledge, people are continually improving their teaching-learning tools and strategies.

Objectives of the Study

The present research is directed at achieving the following purposes:

1. To study the attitude of Mathematics teachers towards the use of ICT.
2. To study the teachers of various levels of experience on their attitude towards ICT.
- 3 To study classroom teaching with a combination of Mathematics & ICT.
- 4 To find out the various techniques and ICT tools used in Mathematics teaching and learning at UG/PG Colleges.

Definition/Meaning of ICT

Firstly we try to understand the meaning of term ICT. ICT stands for Information and Communication Technology. It is the combination of two terms, i.e., Information Technology and Communication Technology.

“Information Technology is a scientific, technological, and engineering discipline and management technique used in handing the information; its application and association with social, economic, and cultural matters.”- UNESCO (2002).

These are devices which are used to communicate and to create, distribute, store, and manage information. The information may be of any kind or any formation. The term ICT is described as the information dissemination, storage, and management of various sets of technical tools and resources that are accepted and for information and communication technologies.

ICT Applications in Online Teaching and Classroom Management

ICT is changing processes of Mathematics teaching and learning by adding elements of vitality to classroom education environments, including virtual environments for the purpose. The new digital ICT is not a single technology; it is a combination of hardware, software, multimedia, and delivery systems. In Haryana, Mostly College Teachers have used a number of applications available free of cost to a limited use as Google Meet, Google Classroom, Zoom. Today, ICT in education encompasses a vast range of rapidly evolving technologies such as Desktop and Portable Computers, Smart Boards, Digital Cameras, the Internet, Cloud Computing, the World Wide Web, Spread Sheets, Tutorials, Simulations, email, Local Area Networking, Virtual Environment, Simulator, Digital libraries, online accessing of books and Journals, Computer Conferencing, videoconferencing etc. ICT allows for the production of digital resources such as digital libraries, where students, teachers, and professionals can access study material and course material from anywhere at any time.

The use of ICT in the mathematics classroom has primarily held of particular concern to mathematics educators. Some examples of the use of ICT in mathematics are portable, graphic calculators, computerized graphing, specialized software, spreadsheets, and databases, etc. By using ICT as a tool for learning, those teachers can maximize the impact of ICT in mathematics education. Students are taught to work in collaborative groups or apply the problem-solving process when using a computer to solve a problem, and then ICT is involved in developing the solution. Higher-order thinking of math students consists of the transformation of information and concepts. This transformation occurs when students combine information ideas, synthesize, generate, interpret, estimate, or reach a conclusion or interpretation. Managing data and thoughts through these processes enable students to solve problems, gain understanding, and discover new meaning. The students' interest towards mathematics is the main factor influencing the learning outcomes of mathematics. ICT can be used advantageously in most areas of mathematics as applied mathematics and solving problems, Geometrical argumentation, Transformations, Probability and Statistical applications

Education enables people to adapt to changes caused in complex societies and World. Knowledge of new technologies helps to create self perspectives that address current and future challenges so that people can adapt to changing circumstances. The concept of use of ICT tools is important in many aspects as it represents as an indicator of teacher quality. In career advancement of teachers based on academic performance indicators (API), more emphasis is given on technology based education. Classroom management is a prerequisite for teaching. The methodology of the research is a different type involving an interpretative, conversation, observation and study secondary sources, like books, articles, journals, Teachers and Student's feedback and websites, etc.

In India, mostly, the teachers of the Colleges are not urgently trained / guided as in schools. In this case, the important thing is that if the trained teachers are taught to connect with ICT in mathematics, they will be able to apply it in classes/courses. As illustrated, various mathematical images of geometry can be presented to the students using a projector. The use of ICT in two-dimensional and three-dimensional imagery will give an obvious idea to the students. With the help of the Internet, new information and data are always available to the students. Self-Regulated students are aware of their academic strengths and weaknesses and well planned about the strategies they use to address the day-to-day challenges of academic work.

Challenges in Learning Mathematics Content and Computer Technology

Difficulties in using ICT and math software are related to the weakness of any mathematics teacher's knowledge of what technology is available and how to use them when learning math. Mathematics teachers will have to take considerable challenges in both mathematics content and computer technology. A number of studies have attempted to explain the impact of mathematics education on a variety of factors. The concept of function concept in mathematics plays a vital role in the learning of students and affects the whole mathematics curriculum, and students of all grades have learned the function concept that through formal perspectives, standards of relevance, materials understanding/ learning standards, etc.

Benefits of Using ICT in Education/ Educational Implications

The use of ICT in education helps in developing critical and scientific thinking among the students and the teachers. It motivates the learner to participate in learning activities at any time and from anywhere. It helps in exchange and shares ideas among teachers for professional growth. ICT has also used to improve access and the quality of teacher training. ICT tools enhance teaching and integrate ICT to develop higher-order thinking skills among learners. ICT tools such as Internet, computer, laptop, tablets, and many other hardware and software applications can be appropriated in the teaching-learning process. These tools can give benefits in the areas of content, curriculum, instruction, and assessment. Science/Mathematics background teachers have a more favorable attitude than Arts/Social Science background teachers towards ICT. Teachers should assist seniors in accessing digital information efficiently and effectively. They also should support undergraduate-centered and self-directed learning.

However drawback of online education is that students feel stressful and affecting their health and social life. Students felt that they learn better in physical classrooms (approx. 66%) and by attending MOOCs (30%) through online education.

Recommendations

1. In National Education Policy 2021, all Teacher training program /Courses should be based on the use of ICT for all subjects.
2. Higher Education Institutions(HEIs) should work to increase the budget of infrastructure for adopting ICT based education such as locally assembled hardware/software to avoid reliance on imported one.
3. Education policy and curricula should be revised periodically to meet the demand of the present situations.
4. Work on improving the Mathematics-teaching style and establish a unique characteristic of the Mathematics-teaching strategy.
5. Continually strive to motivate the students and Co-operative Learning should be encouraged.

Conclusions

This study shows that ICT integration in Mathematics. ICT integration in Mathematics-education has a positive impact on both the teaching and learning process. The study was conducted out to determine the impediments to integration of ICT in mathematics teaching and learning at UG College levels during the crucial time of COVID 19 pandemic. An infrastructure to provide online education is also required. There are some barriers to integrate ICT in teaching and learning mathematics in various branches of mathematics. In the future, I shall extend my study to the institutions of professional development.

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