

R-P-20-21



Journal of the Maharaja Sayajirao University of Baroda  
ISSN : 0025-0422

## “ROLE OF ICT IN TEACHING MATHEMATICS”

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### Abstract

The objective of this study is to explore the role of the appliance of ICT tools in Mathematics teaching. Learning and conversation technologies (ICT) are an integral part of lifestyle, including the teaching-learning process. Mathematics is taken into account the queen of all sciences. For an extended time, the role of mathematics was reduced to the purely academic domain. But at the present, the role of mathematics isn't limited to the purely academic domain. It's entered the sector of technology and industry. This paper will highlight the importance of the mixing of data and communication technologies (ICT) into the teaching and learning of mathematics in Teacher-College and faculty level. The methodology of the research may be a different type involving an interpretative, conversation, observation and study secondary sources, like books, articles, journals, thesis, university news, expert opinion, and websites, etc. Finally, meaningful suggestions are given.

### Introduction

The study is particularly crucial in Teacher-Training Colleges because it presents a period of preparation for the scholars' future courses before making decisions about the student less scientifically or scientifically that mathematics is important and even essential. Mathematics as a science-based course or discipline is understood as a queen of all subjects. Sometimes the teacher of mathematics doesn't have sufficient knowledge, but it's necessary to read into concepts that contradict what the idea of mathematics says or implies. However, mathematics may be a unique subject, which inspires the acquisition of specialised science skills and knowledge, which explains the natural phenomena of life in society. It's something that grows in civilization because the quantity demand of individuals increases. It originated from a practical problem, and therefore the men needed to unravel these problems. It's contributed to the event of civilization and other disciplines and therefore the development of culture. Despite the abstract nature of mathematics, its teaching is that the scientific thinking among students; A mental set that needs students to require the exam through tests. Globalization and technological change have created a replacement global economy driven by technology, data-driven, and knowledge-driven (Tinio, 2009). It's been proposed that the event of ICT has become an important issue to satisfy the requirements of the education system (Chao, 2015). ICT may be a tool that supports the training process and holds the promise of latest solutions to all or any the challenges that education is facing (Oduma & Ile, 2014). Jef Peeraer (2005) highlighting the factors affecting the mixing of ICT into teaching practice in Vietnam's education teachers (Jef Peeraer, 2005).

Thus the interaction may be a strategy to interact teachers & students through a hierarchy of tasks beginning at the required level of navigation and ending in additional dynamic interactions that make real-life stimulations (Aldrich, 2005; Roy, 2006). Externally the active participation of the scholar through e-learning is impossible, and it helps the e-learner to find out for a lifetime (Kumbhar, 2009). there's a positive relationship within students' learning and therefore the use of ICT (Harrison et al., 2002) Both NCTM (The National Council of Teachers of Mathematics) and BECTA (British Educational Communications and Technology Agency) focused on the technology as enabling, also as encouraging the learner to specialise in reflection, verification, decisions making and problem-solving (NCTM, 2000., BECTA, 2003). The prospect of ICT may be a promising practice within the mathematics classroom, but the success of this exercise is especially hooked in to several issues, including teachers' perceptions of ICT skills, teachers' attitudes toward ICT contribution to mathematics teaching, and teachers' attitudes toward ICT contribution to students' mathematics learning. Teacher Passion of ICT within the classroom mathematics, math teacher within the presence of ICT within the classroom self-esteem and sense of control, and teachers aim to mobilize

PRINCIPAL

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ICT in their education (Baya'a, 2013). These possibilities of ICT integrate a proposed practice into mathematics classroom. Although the above descriptions of the factors are affecting ICT convergence at the varsity is involved, this exercise will result as long as certain conditions exist met. ICT within the classroom, especially within the incorporation of a positive outcome will depend upon the subsequent factors: teachers' attitudes to the contribution of ICT for teaching mathematics, mathematics education of scholars and teachers attitudes towards the role of ICT, arithmetic teachers to use ICT within the classroom sense, that presence of ICT within the classroom mathematics teachers' self-esteem and classroom administration ability to integrate ICT in education for teachers and attractions. While pre-service teachers solve math problems, they specialise in the social and socio-mathematical norms that are installed during the interactions of pre-service teachers (Tatsis, 2008). It's the speech of the pre-service teachers to spot the regulated rules when solving a task associated with the definition of mathematics (Sánchez, 2014).

From time out of mind education has become a logo of civilization and development — Tripoli's concept of education as an entire point to teachers, students, and therefore the environment. Not only mathematics teachers but the standard of all teachers within the teacher Department of Education also must be met (Das et al., 2019). Within the contemporary era, education depends on the physical and more importantly, the science of science for technological improvement. Therefore, psychological principles carry significant importance within the learning process. Thus, the policy of student-centered education has gained momentum over the past few decades. As such, all the achievements that are prescribed in several subjects or more clearly marked by students are synonymous with their cognitive development. Mathematics is taken into account a difficult question. Mathematics theoretically provides an easy restoration of logical reasoning and knowledge. It makes it as a selected subject compared to others and shows a simple thanks to learn other things. Development may be a continuous process, which is continuously underway. Providing and acquiring an education is one among the characteristics that set citizenry aside from other living things. For advanced knowledge, people are continually improving their teaching-learning tools and methods. Information Communication Technology (ICT) is an engine of innovation in education, and that we can see within the 21st century, the psychological, socio-economic, and technological changes it brings to high school. It changed the role of data professionals and is becoming popular within the library.

### Objectives of the Study

The present research is directed at achieving the subsequent purposes:

1. To seek out the attitude of Mathematics teachers towards the utilization of ICT.
2. To seek out the attitude of Mathematics background teachers towards the utilization of ICT.
3. To seek out the ICT tools utilized in Mathematics teaching and learning at Teacher-Training Colleges.
4. To seek out the teachers of varied levels of experience on their attitude towards ICT.
5. To review classroom teaching with a mixture of Mathematics & ICT.
6. To review Mathematics teaching towards the utilization of ICT.

### The Methodology of the Study

This study applies an interpretative approach where qualitative data were gathered and analyzed by a document study of the research papers from journals, books, edited books, reports, online documents. The methodology of the proposed research is predicated on the document-based analysis.

### Methodology:

- It's supported qualitative research.
- It's also a document-based analytical study.
- It's the chief characteristics of recent document-based analytical research.

### Research Materials

- Government documents.
- Peer-reviewed Journals.

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Volume-55, No. 1 (IV) 2023



Journal of the Maharaja Sayajirao University of Baroda  
ISSN : 0025-0422

- Books.
- Magazines.
- On-line reports from some relevant and reliable internet sources.

#### **Data Collection Process**

Multiple procedures consisting of studying international and national journals, library consultation, online journals, periodical, newspapers, and monographs have remained employed.

#### **Data Analysis:**

The study employs current document-based analytical approach. to look at the obtained data. the research also adopts historical and sociological strategies.

#### **ICT Tools:**

ICT is changing processes of Mathematics teaching and learning by adding elements of vitality to classroom education environments, including virtual environments for the aim . The new digital ICT isn't one technology; it's a mixture of hardware, software, multimedia, and delivery systems. Today, ICT in education encompasses a huge range of rapidly evolving technologies like Desktop, NoteBook, and Handheld Computers, Digital Cameras, the web , Cloud Computing, the planet Wide Web, Spread Sheets, Tutorials, Simulations, email, Local Area Networking, Bluetooth, Streaming, and DVDs; and applications like word processors, Virtual Environment, Simulator, Digital libraries, Computer-Mediated Conferencing, videoconferencing, Emulator etc. ICT allows for the assembly of digital resources like digital libraries, where students, teachers, and professionals can access study.

#### **Mathematics & ICT:**

Students can use ICT as a tool to perform calculations, draw graphs, and help solve problems. The foremost obvious example of using ICT during this way is when students use a calculator or something like that to perform tougher numbers. However, spreadsheets, computer algebra systems, or graphical calculators are often wont to solve problems by tests and improvement or retrieval methods. Students of mathematics can use graphical calculators or graph plotters rather than algebra to graphically solve an equation.

Students can smoothly perform a statistical analysis of the info they collect using the extensive statistical features of the graphical calculator. Creating a picture during a dynamic geometry package can help a student understand, solve, then prove a geometrical problem. When students use ICT as a tool to assist them search things out, solve problems, or understand what's happening, it often helps them develop their skills within the use and application of mathematics. ICT are often an in depth and efficient tool, but students got to learn the technical skills they have if they're to use the opportunities provided to them constructively and efficiently.

#### **Use of ICT in Various Areas of Mathematics:**

ICT are often used advantageously in most areas of mathematics, but the subsequent regions particularly enjoy the opportunities it offers.

- Applying mathematics and solving problems.
- Equations, formulae, and identities.
- Position value, order, and rounding.
- Sequences, functions, and graphs.
- Transformations.
- Coordinates. (coordinate-geometric)
- Construction and loci.
- Geometrical argumentation: lines, angles, and shapes.
- Probability.
- I'm handling data.
- Statistical applications then on.

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**Use of ICT Tools in Mathematics:**

Maxima is an algebra solver software. The program is predicated on Computer Lisp and works with all POSIX principles like Linux, Unix, OS X, and BSD. For drawing it uses Gnuplot.

Geogebra may be mathematics software that's useful for both teachers and students alike. It's a strong platform that helps preschoolers learn math effectively and solve math problems on different topics that include vectors, calculus, applied mathematics, algebra, complex numbers, statistics, and more.

SymPy may be a Python archive for symbolic mathematics. It aims to become a full-featured computer algebra system (CAS) while keeping the code as simple as possible to be comprehensible and simply extensible.

**Discussions:**

Lack of Professional Development Opportunities Lack of adequate opportunities for teachers to receive ICT based training. Sufficient time for the teachers to coach the themes associated with the practice. ICT and basic ICT training require curricular training about the curriculum. Providing educational training to teachers is more important than simple training for teachers about the utilization of ICT equipment (Johns, 2004). Teachers participating in ICT-related professional development courses aren't confident enough with their lessons regarding ICT. These courses were mainly about necessary ICT skills and didn't teach teachers the way to associate these ICT tools with their experiences. Training content should be blended with educational content technology in training courses for teachers to coach using ICT resources in their respective subjects. Some parameters associated with the technical knowledge and skills, the tutorial skills supported by the technology, the management of the classroom, the knowledge and skills required by the teachers regarding the utilization of technology.

**Lack of Technical Support:**

When working with ICT tools, teachers face technical problems, so teachers attempt to avoid using ICT. Therefore, timely assurances of technical support can help teachers provide appropriate lessons and supply lessons. Technical constraints include Internet connection failure and ICT equipment malfunction. In some cases, teachers argued that the fear of breaking the ICT equipment during the experience might discourage them from using ICT during their teaching practice. ICT training is beneficial enough for teachers, but the shortage of technical support concerns teachers. Therefore, to encourage the utilization of technology, teachers should have proper arrangements to supply technical support.

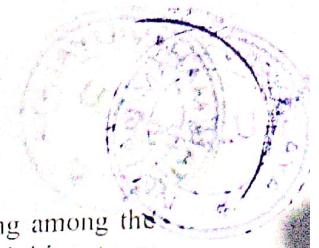
**Benefits of Using ICT in Education:**

- a) Science/Mathematics background teachers have a more favourable attitude than Arts/Social Science background teachers towards Information and Communication Technology (ICT).
- b) Assist seniors in accessing digital information efficiently and effectively.
- c) Produce an ingenious learning environment.
- d) Support undergraduate-centered and self-directed learning.
- e) Offer more opportunities to advance critical (higher-order) thinking skills.
- f) Better education, including collecting quality.
- g) Most of the teachers have a positive attitude towards ICT.
- h) Promote collaborative learning during a distance-learning situation.
- i) Support teaching by facilitating entrance to course content.

**Educational Implications:**

- 1. In India, mainly education has three levels that are primary or elementary level, secondary and senior secondary level, and better level. The standard of these levels are often adjusted by the utilization of ICT tools and techniques.

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2. The utilization of ICT in education helps in developing critical and scientific thinking among the scholars and therefore the teachers. It motivates the learner to participate in learning activities at any time and from anywhere.
3. ICT has also went to improve access and therefore the quality of teacher training. ICT tools enhance teaching, and facilitate learning using multi- modal courseware. Integrate ICT using pedagogical innovations to develop higher-order thinking skills among learners.
4. It helps in exchange and shares ideas among teachers for professional growth.
5. ICT tools like radio, T.V., Internet, computer, laptop, tablets, and lots of other hardware and software applications are often appropriated within the teaching-learning process. These tools can give benefits within the areas of content, curriculum, instruction, and assessment.

From a Student's Point of View, Drawbacks are:

1. Poor internet service during the teaching-learning activities, projects & assignments.
2. Poor ICT infrastructure in classrooms and therefore the library.
3. Teachers lay more emphasis on PPT creativity instead of the subject content.
4. Reduced internet speed due to old computers and old operating systems and low internet access packages.
5. College website not updated for accessing college information.

From the Teacher's Point of View, Drawbacks are:

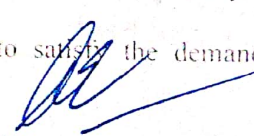
1. Technical Skills: Teachers don't have sufficient skill to develop digital Mathematics contents.
2. Making lessons more difficult: Making electronic content on mathematics education may be a time and money consuming process.
3. Time aspects of digital content making: PowerPoint presentation (PPT) making isn't a simple task which needs excellent technical skills and patience.
4. ICT Education is an incomplete transformation of data because it possesses fewer face-to-face interaction, warmth, empathy, and rapport with learners.
5. Poor ICT accessibility: Poor ICT infrastructure in classrooms like computers, laptops, and overhead projectors. Poor coordination with ICT centers for day to day arrangements.
6. Time constraints to use ICT: Teachers are very busy thanks to credit-based syllabus system college activities, personal researches, and ongoing examinations.
7. ICT restricts the scope of explanation: Some subject contents may require more proof and discussions like problem-solving, drawing mathematical figures, geometrical shapes, drawing curves and graphs, etc.
8. The applicability of all subject's content: ICT isn't easy to use to the Mathematics, application of Mathematics, etc.

#### Conclusions:

This study shows that ICT integration in Mathematics. From literature displayed several problems to utility ICT in mathematics. ICT integration in Mathematics-education features a positive impact on both the teaching and learning process. The study was conducted bent determine the impediments to integration of ICT in mathematics teaching and learning in Teacher-Training colleges & lyceum levels. There are some barriers to integrate ICT in teaching and learning mathematics in various branches of mathematics. Within the future, we shall extend my study to the upper education level for professional development.

#### Recommendations:

1. Teacher educational program (B.Ed.) should be supported the utilization of ICT for all subjects.
2. to scale back the value of infrastructure are often adopting measures like locally assembled hardware/software to avoid reliance on imported one.
3. Education policy and curricula should be revised periodically to satisfy the demand of these situations.

  
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SN: 25-0422

Teachers' attitude towards the utilization of ICT and lack of confidence are often overwhelmed by professional development courses conducted regularly.

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Volume-55, No.1 (IV) 2021

180

