

Impact of Problem Solving Skills in Mathematics

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ABSTRACT

Problem solving skill is one of the basic talents that everyone requires in order to meet the increasing demands of a complex life and Mathematics is built on problem-solving techniques. The concept that mathematics is mostly about thinking instead of memorizing information leads to the prominence of problem-solving in mathematics education.. Problem-solving encourages students to acquire knowledge and describe the strategies required to arrive at solutions rather than remembering and executing a set of strategies. Students can use problem solving to construct, evaluate, and modify their own hypotheses about mathematics as well as the theories of others. After pursuing the integration of technology into the educational system, pen paper technique to solve mathematics has been interrupted and these changes affect learning techniques. Technology should have encouraged creativity and innovation but absurd usage of technology is making problem solving skill inefficient and somehow this connectivity has negative effects on students and teachers. In this paper we will discuss about the impact of technologies on understanding, innovation and learning process of students and teachers.

KEYWORDS: Impact of technology, Maths and Technology, Problem solving skills.

INTRODUCTION: The first requirement for resolving personal and organizational problems is knowledge of the problem-solving process. We can make our life stable by acquiring the ability to solve a problem. We didn't even notice that problem solving skill is making us ready for adapting

the changes and unexpected problems in our lives. Approaching mathematics through problem solving can create a context which simulates real life and therefore justifies the mathematics rather than treating it as an end of itself. Finding possible solutions is a difficult step throughout the problem-solving process because, on the surface, it appears that most of the work has already been completed and the ultimate goal is near. The creation of logical connections between different workable options, thus reinforcing solutions and creating synergy effects, is a significant part of this step of the problem-solving process. It would be great being able to solve every problem accurately and in a timely manner without difficulty; however, there is no one way to solve all problems.

WHAT IS PROBLEM SOLVING TECHNIQUE?

Problem solving skills is the act to identify the problem, determining the cause of the problem, prioritizing and selecting an effective solution. You can use your first incorrect guess as your first step to solve a problem. The best solutions will be different to every investigation accordingly. The following steps of problem solving are:

- **Identify the problem:** We took the first step to solve the problem effectively by identifying the type of problem. Guess and improve is sophisticated method to initialize the direction to get the solution.
- **Determining the cause of problem:** Determining the cause of the problem is helping us to establish a relation between problem and solution .We need source of problem to provide new perspectives, imaginative and experimental solutions to every kind of problem.
- **Prioritizing:** Prioritizing the situation is important to find a relatable solution. Making a list of all constraints and a high level of attention to detail can help us to get the correct solution.
- **Effective solution:** Solving issues effectively and quickly is significant of problem solving skill.

MATHEMATICAL PROBLEM SOLVING SKILL:

To solve mathematical problem you need to be jack of all trades i.e. math needs more than one skill to solve a problem. One of the few psychologists to study on mathematical problems was Karl Ducker (1945) who used the technique “thinking aloud”, which energize the students to think out of the box and making their own ways to solve a problem. There are two types of mathematical problems formula based problems and contradictory problems and good problem solver will understand it accurately. It has been observed

that poor problem solvers may face barriers to discover contradictory problems. Students' anxiety and competitive need to find a specific answer hampered their ability to thoroughly investigate the mathematical problem posed, causing them to overlook critical aspects required to solve the problem set. To solve a mathematical problem we need strong conceptual knowledge and problem solving skills to apply heuristic strategies to problems.

IMPACT OF TECHNOLOGY ON MATHEMATICAL PROBLEM SOLVING SKILLS:

Human is sluggish by nature and always wants some ways to make his tasks easy. This laziness help us to invent many valuable things and here we are in 21st century where we have technology to work for us. Mathematical problem solving is a process that entails a number of factors and tasks in order to achieve a specific goal. It is dependent on a variety of skills and factors, making it difficult to learn and teach. Maths abilities are viewed as volatile and unstable, and efforts are made to encourage law students to practice and persist. These are the reason that formula sheets are not truly mathematical. Memorizing formulas is not mathematics, any more than remembering dates is history or remembering spelling words is literature. Expanding the number of assessment instruments available can help to reduce maths anxiety and support student's knowledge acquisition. Technology allows students to see and interact with mathematical concepts in new ways. Students can experiment and discover new things by using games, simulations, and digital tools. A demo, a web-based graphical analysis calculator, is an ideal spot for educators and pupils.

- **Caveats of technology for students:** The successful mathematician has fewer tools but understands how to use using technology to decrease them on a much significantly to greater extent. The consequences of using these technology and instruments are not expected. Because of technological advancements, it is becoming increasingly difficult to solve a mathematical problem. Students are diverting their efforts from solving a problem to finding the solution from the internet. Websites are now more concerned with improving their rankings than with providing the necessary information. Humans have always been far better at inventing tools than at using them wisely. We can see it clearly that these days students are more focused on finding the solution and it is affecting their problem solving skill directly. Mathematics necessitates a significant amount of problem-solving discipline. With certain aspects of mathematics,

technology cannot simply replace good old-fashioned paper and pencil. Some students may take advantage of these technology but many of the students just got short term solution and forget that solution. These ways are increasing their difficulties for future problem. Students are shifting their priorities from innovation and understanding to borrow ideas from others.

Question: Given three sides are 3, 4, 5 are making a triangle or not.

Inquiry: When ask this question to the students, then it took them a while to process this question and they need help to understand the ways to solve this question. They borrow ideas from the internet he will borrow without having complete knowledge of that solution. This is the main attraction to the logic that technology is affecting the criteria of innovation, creativity and understanding. Cheating was much more difficult when handsets could not be used to connect to the internet during tests.

- **Caveats of technology for teachers:** It is already complex to find the ways to balance the academic needs and student understanding in mathematics. The teacher's actions had both internal and external effects on the students' mathematical problem solving abilities. In general, teachers are led by an approach that encourages achievement. Becoming a math teacher is not that problematic, but teaching math well is a complex endeavor (National Council of Teachers of Mathematics, 2000). However, an environment should be created in which the answer is not the most important factor and students can observe the lively diversity that mathematics and problem - solving skills can provide. It is critical for educators to know how an optimistic, strategic connection with technology can gain both them and their students. To achieve these goals, teachers must broaden and uphold their knowledge of learning technologies, as well as enhance their ability to critically examine digital tools and resources in order to identify those that will benefit their students the most. Teachers will help to influence a digital world that benefits everyone. Some educational technologies include eLearning, Video-Assisted Learning, Learning Analytics, and Immersive Learning with VR and AR. Particularly eLearning, an additional tool that not only enhances the approachability of

education, but also changes learners' learning behaviors and desires to learn. Furthermore, they recognize the importance of professional development in modernizing the abilities of the existing faculty, especially for educators who are not fully skilled. Technology must have to become the strength of teachers, so that they can touch the ability to overcome these understanding gaps between them and students.

Question: We have to fill a cube of side 3cm with water, how much water we need?

Inquiry: when this question is presented to the students, most of the students will start using mobile. Time bound, strength, lengthy syllabus and lack of consciousness etc are some reason teachers were unable to bond with the student and student didn't realize that they are destroying their problem solving skill. We have solution for this problem i.e. technology. If teachers have good command on technology then they can manage whole class and connect the students with the question and tell them follow 3 steps

- Understand the question and its constraints
- Try to find the effective solution with the help of book or group discussion
- Go home and make a report of your solution and try to find best solution to this question with the help of internet.

CONCLUSION:

Problem-solving can be fulfilled in any mathematics classroom by modifying teaching and incorporating active learning techniques. Student-centered approach will result in a more beneficial and interesting learning experience. Student can approach a greatest level of success by taking guidance from their teachers. Given the attempts to include problem-solving as an essential part of the mathematics curriculum and the limited integration in classrooms, achieving this goal will require more than rhetoric. While successful career learning, technology, and more time are necessary steps, it is possible that problem-solving in mathematics will only become cherished when elevated observation reflects the importance of students' critical thinking and problem solving. Furthermore, teachers were able to use that knowledge and capabilities to teach math and technology concepts by active participation in

the in-service training session. Teachers and students do learn from one another, and providing opportunities for teachers to interact in a professional setting that allows them to examine, communicate, and share ideas and concerns is pivotal for change to occur. Technology must have to become the strength of teachers, so that they can touch the ability to overcome these understanding gaps between them and students. . Students and teacher understanding have a great impact on student's problem solving skill Time management, digital learning, e-tools will make possible for teachers to make bond with students and aware them about the ways to use technology as their servants.. Since student gets influenced by the teacher, teacher should have learn to use technology effectively as a servant to simplify mathematics for understanding.

REFERENCES:

- [1] "Mathematics Through Problem Solving | Math Goodies", Mathgoodies.com, 2022.
- [2] "Think-alouds | Classroom Strategy | Reading Rockets", Reading R o c k e t s , 2 0 2 2 . [O n l i n e] . A v a i l a b l e : https://www.readingrockets.org/strategies/think_alouds.
- [3] T. Hartsell, S. Herron, H. Fang and A. Rathod, "Effectiveness of Professional Development in Teaching Mathematics and Technology Applications", Journal of Educational Technology Development and Exchange, vol. 2, no. 1, 2009.
- [4] L. Vitoria and M. Monawati, "IMPROVING STUDENTS' PROBLEM SOLVING SKILL IN MATHEMATICS THROUGH WRITING", Jurnal Ilmiah Peuradeun, vol. 4, no. 2, p. 231, 2016.
- [5] L. Tartre, "Spatial Orientation Skill and Mathematical Problem Solving", Journal for Research in Mathematics Education, vol. 21, no. 3, pp. 216-229, 1990.
- [6] F. Alatas and N. Yakin, "The Effect of Science, Technology, Engineering, and Mathematics (STEM) Learning on Students' Problem Solving Skill", JIPF (Jurnal Ilmu Pendidikan Fisika), vol. 6, no. 1, p. 1, 2021.
- [7] W. Rahmawati, "The Effect of Problem Solving - Focused Coping Skill Towards Stressed Nurses with Extrovert and Introvert Personality", International Journal of Psychosocial Rehabilitation, vol. 24, no. 3, pp. 2534-2543, 2020.