Problem Solving Ability: Significance for Adolescents

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Abstract

Every problem is an opportunity for learning. Everybody faces many problems in life. The adolescence age is the age of various problems due to physical and emotional changes. Problem solving is the natural process in human being, but we cannot that it will develop at its best level. It is also a slow process, but with deliberates efforts and special training, skill of problem solving can be developed. Various types of co-curricular activities can be organized frequently to promote qualities such as cooperation, tolerance, open-mindedness and sharing of responsibilities to enhance the Problem Solving Ability. Parents should help their children in solving their problems independently at their own pace. Computer programming enhances problem-solving abilities and promotes creativity and reasoning ability of students.
Keywords: Problem solving ability, students.

"Problems are only opportunities in work clothes"

Henri Kaiser

PROBLEM SOLVING ABILITY

Problem solving occurs when an organism or an artificial intelligence system needs to move from a given state to a desired goal state. Problem solving activities get students more involved in the process of learning and enhance the use of higher level thinking process. Problem solving involves the application of principles and facts to explain new phenomena or predict consequences from known conditions. The task of problem solving requires prediction, analysis of facts and principles to develop cause and effect relationship in physical phenomena. Generally, our daily life activities are followed in routine and we do not face any problem to perform our routine duties. But this is not always so, sometimes we are confronted with a

problematic situation which acts as an obstacle to reach the goal. These obstacles may be physical, social and economic which may hinder the progress of an individual towards the goals. Problem solving is an alternative to assessments and diagnostic categories as a means to identify students who need special services. Bandhana and Darshana (2012) found that emotional intelligence and home environments have significant impact on the problem solving ability of adolescents.

Problem solving is the frame work or pattern within which creative thinking and reasoning takes place. It is the ability to think and reason on given levels of complexity. The state of tension created by unsatisfied wants and drives enable the individual to exercise his greatest effort and to use his best language techniques, observations, predictions and interferences to control the difficulties that hinder the progress towards his goal of wants and satisfaction. Problem solving ability plays an important role in the academic achievement of students.

NEED AND IMPORTANCE: Problem solving is the key to success and has been regarded as the most significant aspect of human behavior. One of the major aims of education is to develop the ability to attain better performance. No two individuals are alike. There are individual differences in the problem solving ability. Some individuals can handle a situation, but others cannot. A large part of an individual's life is spent in a struggle to find effective solution to his problems. A student having good problem solving ability will be properly adjusted in the class as well as at home. A problem cannot be solved without thinking. The need of problem solving behavior is to create the power of thinking which helps to find out the solution of the problem. The main objective of problem solving is to go through the physical, psychological, social and environmental factors which hinder the progress of an individual to attain certain goals.

Problem Based Education is an approach that aims to have students gain the skills of learning with self-governance, independent studying, questioning and problem solving, is an approach that provides the students to self-research and learn whenever they encounter similar situations during their lifetime. This approach is based upon from real situations forming problem situations and scenarios. Learners, under the guidance and management of the teacher, learn to discover, analyze, and solve the problem and together the required data to learn both individually and in groups. Teacher is the main source to help the students to improve their problem solving skills. This situation provides the students with opportunities of problem solving, and helps them to rise as good problem solvers in future. In this situation teachers' understanding, belief and

approaches problem solving is important. Therefore it is believed that revealing teacher candidates' skills of problem solving and approaches problem solving is important.

Steps in Problem-Solving: In order to correctly solve a problem, it is important to follow a series of steps. Many researchers refer to this as the problem-solving cycle, which includes developing strategies and organizing knowledge. While this cycle is portrayed sequentially, people rarely follow a rigid series of steps to find a solution. Instead, we often skip steps or even go back through steps multiple times until the desired solution is reached.

1. Identifying the Problem: While it may seem like an obvious step, identifying the problem is not always as simple as it sounds. In some cases, people might mistakenly identify the wrong source of a problem, which will make attempts to solve it inefficient or even useless.

2. Defining the Problem: After the problem has been identified, it is important to fully define the problem so that it can be solved.

3. Forming a Strategy: The next step is to develop a strategy to solve the problem. The approach used will vary depending upon the situation and the individual's unique preferences.

4. Organizing Information: Before coming up with a solution, we need to first organize the available information. What do we know about the problem? What do we *not* know? The more information that is available, the better prepared we will be to come up with an accurate solution.

5. Allocating Resources: Of course, we don't always have unlimited money, time and other resources to solve a problem. Before you begin to solve a problem, you need to determine how high priority it is. If it is an important problem, it is probably worth allocating more resources to solving it. If, however, it is a fairly unimportant problem, then you do not want to spend too much of your available resources into coming up with a solution.

6. Monitoring Progress: Effective problem-solvers tend to monitor their progress as they work towards a solution. If they are not making good Progress toward reaching their goal, they will reevaluate their approach or look for new strategies.

7. Evaluating the Results: After a solution has been reached, it is important to evaluate the results to determine if it is the best possible solution to the problem. This evaluation might be immediate, such as checking the results of a math problem to ensure the answer is correct, or it can be delayed, such as evaluating the success of a therapy program after several months of treatment.

PROBLEM SOLVING STRATEGIES: Algorithms: An algorithm is a step-by-step procedure

that will always produce a correct solution. A mathematical formula is a good example of a problem-solving algorithm. While an algorithm guarantees an accurate answer, it is not always the best approach to problem solving. This strategy is not practical for many situations because it can be so time-consuming.

Heuristics: A heuristic is a mental rule-of-thumb strategy that may or may not work in certain situations. Unlike algorithms, heuristics do not always guarantee a correct solution. However, using this problem-solving strategy does allow people to simplify complex problems and reduce the total number of possible solutions to a more manageable set.

Trial-and-Error: A trial-and-error approach to problem-solving involves trying a number of different solutions and ruling out those that do not work. This approach can be a good option if you have a very limited number of options available. If there are many different choices, you are better off narrowing down the possible options using another problem-solving technique before attempting trial-and-error.

Insight: In some cases, the solution to a problem can appear as a sudden insight. According to researchers, insight can occur because you realize that the problem is actually similar to something that you have dealt with in the past, but in most cases the underlying mental processes that lead to insight happen outside of awareness.

EDUCATIONAL IMPLICATIONS: In order to increase the problem solving ability of the adolescent, congenial home environment need to be created by the parents for their desirable sufficient positive growth. The parents should pay special attention to them. They should encourage them to solve their day to day problems by using their cognitive abilities. Moreover, the parents should also provide rich and balanced diet, so that they remain physically fit and mentally alert and they have high problem solving ability. It is the responsibility of the teachers to identify such student who have low problem solving abilities and try to modify their learning and thinking power through various audio-visual aids. In order to increase the problem solving ability and academic achievement of the students, qualified and well-trained teachers should be appointed in the schools so that they may understand the difficulties faced by the students and help them in developing their cognitive abilities. The teachers should inform the parents regarding the poor academic achievement of their children. Parents should help their children in solving their problems independently at their own pace. They should engage their children in specially designed problem solving activities to increase their problem solving ability. It is

desirable to organize problem solving contexts and competitions in the society especially for these students. The students should be encouraged to participate in these contexts which will definitely increase their problem solving activities.

SUGGESTIONS ON IMPROVING STUDENTS' PROBLEM SOLVING ABILITIES:
Within the classroom environment, it is difficult to monitor and interpret the habits of each individual student; however, educators can certainly use the results of the study to impact the methods that they use to deliver the information to the students in the classroom and also in more individualized settings. Educators not only provide content information, but serve as role models to the students in the problem-solving process. While working with the students, educators should emphasize the key aspects of the problem, whether that is the terminology, the values provided, or the like, that directed them in the problem-solving process. The students need to recognize and understand the visual cues that enable the solution of a problem that make the problem unique and also how to use similar visual cues in the solution of a future problem. . Within smaller environments, such as recitation sections or office hours, individualized attention can be given to the student, and recommendations regarding the problem-solving process can be implemented with dramatic impact on the individual student. Simply asking the student to read the problem and perform a short think aloud protocol can assist the educator in understanding the misconceptions that arise from the lecture material in the mind of the students, not only helping the student at the moment, but also assisting in the continual improvement of the lecture environment.

CONCLUSION: It is universally acknowledged that school life is most important and crucial period in life of an individual characteristics and problems. The problems may create disturbances and disequilibrium in developing process of an individual. Therefore, the educators must re-define traditional teaching methodologies which often do not match students learning styles and skills needed in society. Educators can play an instrumental role in fostering an environment of teaching and learning by presenting topics in an activity oriented manner to mitigate or prevent math anxiety. For instance, concept can be taught through mathematical modeling related to day to day life activities, forming math clubs for interaction among students on mathematical phenomena, audio-visual aids, hands on activities and technology. Computer programming enhances problem-solving abilities and promotes creativity and reasoning ability of students. Teachers who teach mathematics to the students need a strong background in

mathematics content. Inquiry-oriented mathematics instruction, tasks and activities, can assist students to develop his/her talents. Various types of co-curricular activities can be organized frequently to promote qualities such as cooperation, tolerance, open-mindedness and sharing of responsibilities to enhance their Problem Solving Ability.

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