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***ABSTRACT***

**DEVELOPMENT OF HIGHER ORDER THINKING SKILLS IN INCLUSIVE CLASSROOM THROUGH SOCRATIC METHOD**

Developing higher order thinking skills in any classroom is crucial to the success of the students in that classroom. Students need to learn these skills at an early age to be academically and professionally successful in the future. In an inclusion classroom, these skills are even more important for the academic future of every general and special education student. The brains of the children with disabilities, do not process the same way and this can make tasks more difficult for them. However, this does not mean that they cannot solve the problem or think critically about the situation. They must be taught from a young age how to properly solve the problem and how to step-by-step think critically about any problem that may arise. Several strategies can be used to teach these vital skills to both typical and atypical developing students. Teachers need to learn different strategies to develop higher order thinking skills in a general and a special education classroom. This will attract the students and will increase their involvement, understanding and will enable them to adapt the content of the lessons that have been learned. An appropriate learning method can be used in improving the higher order thinking skills is the Socratic Learning Method. A concrete Socratic dialogue and series of questioning that are logic to construct an argument and conclusion will stimulate the thought and child will start thinking more critically. When the student has mastered the content of the lesson, they will be able to diversify methods for finding the solution of a problem in line with the requirements of higher order thinking skills.

**DEVELOPMENT OF HIGHER ORDER THINKING SKILLS IN INCLUSIVE CLASSROOM THROUGH SOCRATIC METHOD**

The main two components of science education are scientific knowledge and the acquisition of scientific knowledge. Study of facts, laws, hypotheses, and theories in science gives scientific knowledge and it is acquired by applying the knowledge to new situations by using various science process skills. It requires students to use their higher order thinking skills.

**Higher Order Thinking Skills :** The concept of higher order thinking (HOT) is derived from the Bloom taxonomy of cognitive domain introduced in 1956 (Forehand, 2010). The cognitive domain involves six levels of thinking, starting from the simplest to the most complex: knowledge, comprehension, application, analysis, synthesis and evaluation (Clark, 2010; Yahya, Toukal, & Osman, 2012). The first three levels of Bloom’s taxonomy i.e knowledge, comprehension and application are called as lower level of thinking skills. However, the upper three levels of Bloom’s taxonomy require students to use higher order thinking skills hence fostering their learning performance (Forehand, 2010; Yahya, Toukal, & Osman, 2012). Higher order thinking skills involve the higher cognitive skills i.e. the skills to analyze, synthesize, evaluate and create a novel idea. Previous researches indicate that development of higher order thinking skills helps the students to become more aware of their own thinking and also nourish their learning performance and cognitive growth (Donald, 2002; Perkins, Jay, &Tishman, 1993). When students are made to face unknown problems, uncertainties, questions or dilemmas, their higher order thinking skills are activated. Cultivating the student’s ability to think at a higher level has been an important theme for redesigning and reforming learning systems (Kim, 2005).

Today, the education system has been changed where the girls and boys are given the same education and are allowed to study in the same classroom. Students from different cultures, caste and creed are welcomed into the same school structure where they get equal opportunities to learn and grow. In such a system, where all the children have right to education, only the group of disabled children was left out. Since then, the differently abled children were pushed off to the side or were enrolled in the “special schools”. The teachers were not well trained for special instructions and the students suffered because of the lack of a decent and free education. These children were sent into a separate room for the entire school day, where they isolated from the other students and were pushed into a restrictive environment to learn alone. Educators, researchers and government worked diligently and legislation was passed called the Individuals with Disabilities Education Act. Now, differently abled children can sit and study in the normal classroom. Children with disabilities can access now free appropriate public education and can have use of academic instructions and activities when placed into an inclusion classroom with their non-disabled peers. A correct and desired social behaviour will be developed as the stigmas and labels associated with children with disabilities will break down and thus they will get the opportunity to grow and develop alongside other children.

**HOTS in Inclusive Classrooms:** Key focus of science education should be to develop higher order thinking skills in students and making them able to solve the problems locally and globally. However, teachers often believe that this important goal is not intended for all students (Zohar &Vaaknin, 2001). Problem solving and critical thinking are two very important skills, however, these skills are ignored in the school curriculum around the nation, specifically in inclusion curriculum (Agran, Blanchard, Wehmeyer, & Hughes 2002). It is normally expected that students will develop these vital abilities without actually being taught how to think critically and solve problem. It is also a common belief that activities which activate higher order thinking skills are appropriate only for normal classrooms and not for the inclusive classrooms, where a variety of students have to be dealt with.These skills are even more important to be taught and developed in inclusive classrooms for the successful academic future of both general and special students. Teachers are needed to be trained with various strategies which help to develop higher order thinking skills in a general and a special classrooms. Research literature shows a variety of strategies to work and the best all over the country in the inclusive and normal classrooms.

**Strategies to Develop HOTS:** Teachers can activate higher order thinking skills among students by creating an environment in classroom where students get opportunity to collaborate and develop communication, problem solving, decision making and shaping self-esteem skills. Integration of HOTS activities help the teacher to prepare the content that can be best be learnt by students. Such teaching approach is needed which helps to advance reading, writing, speaking and listening skills, enable better reasoning , boosts decision-making and problem-solving, make critical analysis and evaluation of student’s own emotions and values and to make intelligent choices in human relationships . The science curriculum should focus on promoting students’ higher order thinking skills (HOTS), through doing different activities that require them to use these skills (Vernez& Constant, 2014). Meta-cognition, creativity, critical and logical thinking are the main components of higher order thinking skills. When a person faces and tries to solve a complex problem or experiences dilemmas, these skills are actually itself triggered. Reasoning, inquiry, questioning techniques, creativity and solution of the problem are 5 key elements to be implemented in the classroom for activating higher order thinking skills. Questioning and dialoguing through Socratic method is a suitable approach for developing these higher order thinking skills among students.

**Socratic Learning Method and Stimulation of HOTS**

Socrates' theory believes that students must be enabled to think for themselves rather than to fill their heads with "correct" responses. Therefore, through proper dialoguing a teacher must engage his students to respond the questions with questions, instead of answers. This method motivates divergent rather than convergent thinking. At first ‘a common piece of text’ is given to the students to read thoroughly and then open-ended questions are posed. It will lead the students to think critically, analyze alternative possible meanings in text, and express their views with clarity and confidence. When teachers and students learn to dialogue, then they are able to ask meaningful questions. It will trigger and activate thoughtful interchanges of ideas which play more important role than memorizing the correct answer.Students carefully listen to the other’s viewpoints and respectfully respond to one another. A simple act of socialization where the participants of the dialogue call others with their names and look each others in the eyes, reinforce appropriate social behavior and encourages team spirit.

Socratic Learning Method is one of the appropriate learning methods used in boosting the higher order thinking skills in the students. It includes concrete Socratic dialogues and a series of questioning that leads to construct an argument on a concept. The purpose of dialogue in the approach is to discuss a problem for finding a solution. Usually dialoguing occurs between the two individuals when they interact with each other, but when learning occurs in the classroom, dialogue interaction occurs in the groups with the involvement of teacher. The role of the teacher is to be a facilitator and stage setter for the group. Teacher here ensures that the group is always in dialogue with debating until all the setbacks can be solved. All the arguments raised by the participants of the group are synthesized and an optimal solution is tried to be achieved. Further, in the form of a Socratic seminar, a series of questions and their relevant answers are tried to be constructed and conclusions are made. As all the human beings are creative enough in the act of asking questions and seeking answers so the Socratic method directly advocates the need of students to exercise their experiences and urge for asking and responding in the context of daily life. It stimulates the student’s thought process and they start thinking more critically. When the content of the lesson has been mastered by the students, they will be able to diversify methods for finding answers to the questions in line with the requirements of higher order thinking skills.

While questioning, the teacher acts as a critical thinker who not only respects students' viewpoints and probes their understanding, but also shows genuine interest in their thinking. The teacher asks questions that are more meaningful and related to the topic. The teacher creates and maintains an intellectually stimulating classroom environment where the values of the students are acknowledged. An intellectual, open, safe and demanding learning environment is produced, where the students will be challenged, yet comfortable in answering the questions deliberately in front of their peers.

**Development of Problem Solving and Critical Thinking Skills in Inclusive Classroom through Socratic Approach**

Classroom environment is the best place to teach the skills of critical thinking and problem solving. Problem solving and critical thinking are not skills that are innate or instinctive, but they are crucial to the learning process for all children (Agran, Blanchard, Wehmeyer, & Hughes 2002). Students should be given the opportunities to practice these skills in order to foster a thinking-friendly classroom environment. These skills are best developed if they are taught at the young age in the elementary classroom or even better if continue to teach from home. The process will cultivate a stronger sense of critical thinking and problem solving right through high school and into college and beyond. The role of the teacher is to develop and foster these skills by regularly challenging the students and pushing them to give their best in their academic studies.

A number of strategies can be useful in a general education classroom but the push for inclusion leaves teachers searching for new and different ways to teach problem solving and critical thinking to children with disabilities that which is also new to their classrooms. These **c**hildren often face difficulties or are left behind in school as the content becomes more rigorous with time. In an inclusive classroom, teacher has different group of students to whom he has to teach problem solving and critical thinking skills. Typically developing students and students with disabilities or developmental delays are equally important in any classroom as the students who are on grade level or normal students. Teacher must ensure by modifying his instructionsso that every single child can learn these vital skills in the classroom. Teaching through Socratic method is an appropriate strategy to teach problem solving and critical thinking in the inclusionclassrooms. .

“Problem solving involves reasoning and analysis, argument construction, and the development of innovative strategies” (Woodward et al., 2012). While developing problem solving and critical thinking skills among students through Socratic approach, teacher should keep following four simple truths in mind for better teaching.

* Every child is unique and has different learning capacity so teaching these skills should be accordingly different within the classroom,
* These skills can be learnt and can also be taught.
* There are alternative ways available to find the solution of a problem.
* These skills should be introduced within the context of the curriculum and core content.

While dialoguing the students collaborate and interact with each other within the group and start viewing the problem together and try different and unique ideas to solve that problem.Further, teachers ask series of questions to create and foster an environment where students can learn to think critically about the content in their lessons and relate with the world around them. Critical thinking is a skill which involves analyzing and evaluating data about a certain subject and giving a justified opinion or judgment about that data. It involves the authenticity, accuracy, or value of something. It is assessed by the ability of a person to seek the reasons or alternatives, perceive the total situation, and on the basis of evidences try to change one's views. It is characterised by the use of logics and evidences, as well as the synthesis and analysis of the information. Critical thinking is also developed with problem solving skill. When the students are made to face the problem or an unknown question, they start thinking critically about its solution or for finding the suitable answer. Problems force children to analyze and evaluate the data that has been presented in order to come up with a viable solution (Schneider, 2002).

A congenial environment must be created by teachers in the classroom where the students find a comfortable space to ask questions without any fear or anxiety. Teacher should encourage the environment in his class which allows for more than one correct answer and more than one solution to a problem. Similarly, teachers should pose such questions that make their students to think critically instead of reciting and memorising the answers only. Students should understand the problem, devise a plan, carry out the plan, and then look back and reflect (Griffin & Jitendra, 2009). These steps help the students to break down a big and complex problem into understandable smaller and easier pieces. Teacher talk also plays an important role in teaching problem solving to children with disabilities. A study performed by Baxter, Woodward, Wong and Voorhies in 2002 focused on the impact of teacher and student discourse in the subject of mathematics on students with disabilities. If the teachers ask more questions to the children with disabilities and evaluate them regularly can engage them more likely and can see the fast changes in them. It is a common classroom activity to ask questions and to wait for satisfactory their students’ engagement in Socratic approach of teaching. However, questions are more likely to get all students to think and solve the problem alongside the teacher, in an inclusion classroom. A special care is needed to be given to the students with disabilities as they can easily be distracted or unfocused in a general classroom. Therefore, different opportunities should be provided in the classroom, especially the activities which appeal to the disabled student’s interests or curiosities, so that they can be well engaged and maintained their attention for the longer periods of time. Teachers must consider and cater to the needs of the individual students in the inclusive classrooms, i.e. both general and special education children.

Small groups of students when work together to solve a problem or to answer a question, they learn from each other. Children with disabilities can be engaged when given a hands-on activity, but this method also gives them a chance to learn from their peers and for their peers to help them (Schneider, 2002). The value of collaboration in problem solving can be well taught in group work when the participants of each group talk together, help one another especially the stronger to the weaker ones and consult the teacher when they feel like. After learning from each other, ultimately the conclusions are shared with the whole class. During the process, teachers walk through the steps with the each student and keep the track of each step as the teacher goes through the problem. Thus all the students feel included and also they practice and memorize the steps. If needed, teachers can simplify the problems by explaining the content in a simplified and polished way e.g. answering to a question and asking the student to explain how the answers were made. With this, the child with disabilities can answer a question or solve a problem, but in a different way than their general education peers. By varying the instructions and catering to the child’s needs, teacher in his inclusive classroom can make the disabled students learn and understand the value and importance of problem solving and promote to high school and college levels by carrying it with them.

Critical thinking skills are equally essential as problem solving skills. Both these higher order thinking skills go hand in hand as without critical thinking, there would be no problem solving. Also, both these skills are needed to be activated in the children with disabilities in order to succeed in school and in life. Development of critical thinking skill in a child with a disability is not an easy task as their brain is different from others. Yet, we cannot ignore them as they also have the abilities to think logically and to learn efficiently. It is incorrect to make perception, that if a student cannot write or speak, it means he cannot think critically. Multiple choice questioning is a good method to develop and measure critical thinking among students with disability. Generally, multiple choice questioning method is considered a recall-oriented form of evaluation, but actually, it can be utilized to begin the critical thinking process. Bassett (2016) believes that students can show critical thinking by answering multiple choice questions and then explaining why they chose that particular answer. Students with disabilities often find the correct answer but struggle with explaining the reason that why they chose this answer. Teachers can generate the situations for the students where they can provoke a deeper thought process. Students may not be able to speak, write or express themselves, but still they can critically think and explain what is going on in their minds. For this, they can take help of computer, any other suitable machine as means of communication. Thus they will be encouraged to think critically about their answers.

**Conclusion:**

There are so many different lines of thought on how to teach higher order thinking skills in an inclusive classroom where a teacher has to deal with normal and special children. All children should have the right to education but disabled children are usually ignored. They are pushed off to the side or enrolled in the “special schools” where the teachers are not well trained for special instructions and the students suffered. The push for inclusion demands from teachers to search for new and effective ways to teach problem solving and critical thinking to students with disabilities. In an inclusive classroom, a teacher’s role increases where he has to cater the needs of the general and special education children. Problem solving and critical thinking are higher order thinking skills which are very vital and go hand in hand. There is need to develop these skills in children with disabilities so that they can succeed in life. Development of these skills in a child with a disability is a difficult task as they are different from others. A teacher cannot ignore them as they also have the abilities to think and to learn. Higher order thinking skills require higher order cognitive skills which nourishes the student’s learning performance and cognitive growth. Integration of these skills in teaching learning process makes the teacher able to prepare the content that can be best learnt by students. Several strategies are there to teach higher order thinking skills in students. Teaching with Socratic method is a sound approach which can help to develop higher order thinking skills among students in a general and a special education classroom. Its implementation will attract the students and will increase their involvement and understanding of the concept. Teaching with Socratic Learning Method will boost the higher order thinking skills in the students. Socratic dialogues, questioning and seminar will help them to construct an argument on a concept because when a student faces a problem, he starts thinking critically about its solution. Child is encouraged to analyze the problem more critically and start finding the possible solution. Teacher can also arrange different facilities for the disabled children in the classroom, which aid them to stimulates their thought process and activate the desired skills in an intellectual, open, safe and demanding learning environment.

**References:**

* Agran, M., Blanchard, C., Wehmeyer, M., & Hughes, C. (2002). Increasing the problem-solving skills of students with developmental disabilities participating in general education. *Remedial and Special Education*, 23 (*5),* 279-288. Retrieved from <http://www.beachcenter.org/Research%5CFullArticles%5CPDF%5CSD16_Increasing%20the%20ProblemSolvingSkills.pdf>
* Bassett, M. H. (2016). Teaching critical thinking without (much) writing: Multiplechoice and metacognition. *Teaching Theology and Religion*, 9 *(1),* 20-40. Retrieved from <http://onlinelibrary.wiley.com.ezproxy.liberty.edu:2048/doi/10.1111/teth.12318/full>
* Baxter, J., Woodward, J., Wong, J., &Voorhies, J. (2002). We talk about it, but do they get it? *Learning Disabilities Research and Practice*, 17(*3*), 173–185.
* Clark, D. (2010). *Bloom's taxonomy of learning domains: The three types of learning*. Retrieved from <http://www.nwlink.com/~donclark/hrd/bloom.html>
* Donald, J. G. (2002). *Learning to think: Disciplinary perspectives. The Jossey-Bass Higher and Adult Education Series.* San Francisco, CA: Jossey-Bass.
* Forehand, M. (2010). *Bloom’s taxonomy. Emerging perspectives on learning, teaching, and technology.* Retrieved from <http://projects.coe.uga.edu/epltt/index.php?title=Bloom%27s_Taxonomy>
* Griffin, C. C., & Jitendra, A. K. (2009). Word problem-solving instruction in inclusive third-grade mathematics classrooms. *Journal of Educational Research*, 102 *(3*), 187-201. Retrieved from <http://search.proquest.com.ezproxy.liberty.edu:2048/docview/204264753/fulltextPDF/21A9047A7A034284PQ/1?accountid=12085>

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). Multivariate data analysis(7th ed.). Upper

http://search.proquest.com/docview/305419245?accountid=28930

http://search.proquest.com/docview/305419245?accountid=28930

Kim, Y. (2005). Cultivating reflective thinking: The effects of a reflective thinking tool on learners' learning

* Kim, Y. (2005). *Cultivating reflective thinking: The effects of a reflective thinking tool on learners' learning performance and metacognitive awareness in the context of on-line learning*. (Doctoral dissertation,The Pennsylvania State University). Retrieved from <http://search.proquest.com/docview/305419245?accountid=28930>

Pennsylvania State University). Retrieved from

Pennsylvania State University). Retrieved from

performance and metacognitive awareness in the context of on-line learning.(Ph.D dissertation,The

* Perkins, D., Jay, E., & Tishman, S. (1993). New conceptions of thinking: From ontology to education. *Educational Psychologist*, 28(*1*), 67-85.

Saddle River, NJ: Pearson.

* Schneider, V. (2002). Critical thinking in the elementary classroom: Problems and solutions. *Educators Publishing Service*, 1-3. Retrieved from <https://eps.schoolspecialty.com/EPS/media/SiteResources/Downloads/articles/Critical_Thinking-Schneider.pdf>
* Vernez, G., & Constant, L. (2014). *Strategic Priorities for Improving Access to Quality Education in the Kurdistan Region—Iraq. Santa Monica, CA: RAND Corporation*. Retrieved from <http://www.rand.org/pubs/monographs/MG1140z2-1>
* Woodward, J., Beckmann, S., Driscoll, M., Franke, M., Herzig, P., Jitendra, A., Koedinger, K. R., & Ogbuehi, P. (2012). *Improving mathematical problem solving in grades 4 through 8: A practice guide (NCEE 2012-4055).* Washington, DC: National Center for Education Evaluation and Regional Assistance. Retrieved from <http://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/mps_pg_052212.pdf>
* Yahya, A. A., Toukal, Z., & Osman, A. (2012). Bloom’s Taxonomy-Based Classification for Item Bank Questions Using Support Vector Machines*.* In Y. Kaffari and H. Hussan (Eds.) *Modern Advances in Intelligent Systems and Tools* (pp. 135-140). Berlin, Germany: Springer.
* Zohar, A. &Vaaknin, E. (2001). Teachers’ beliefs about low-achieving students and higher order thinking. *Teaching and Teacher Education*, 17(*4),* 469-485.