CHAPTER 16

ENGAGING HIGHER ORDER THINKING SKILLS IN SPECIAL NEEDS EDUCATION

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Introduction

Thoughts are the single most important physical item in determining destiny, this is true even in the case of Persons with Special Needs(PWDs). Although all humans think, but how they think makes the difference. In clinical diagnostic and functional development, PWDs refers to individuals who require assistance for disabilities that may be medical, mental, or psychological (Wikipedia - Special needs). According to Wikipedia, Special needs can range from people with autism, Asperge syndrome, cerebral palsy, Downsyndrome, dyslexia, dyscalculia, dyspraxia, dysgraphia, blindness, deafness, ADHD, and cystic fibrosis. They can also include cleft lips and missing limbs. The types of special needs vary in severity, and a student with a special need is classified as being a severe case when the student's intelligence qoetients (IQ) is between 20 and 35 *(National Council for Special Education).* The National Policy on Education (2013), categorized persons with disabilities into persons with visual, hearing, physical/health intellectual, emotional/behavioural, speech/language learning, multiple impairments. It added the gifted and talented as well as the albinos. These students typically need assistance in school, and have different services provided for them to succeed in a different setting(Flook, 2019; Calderwood andBethany, 2022).These categories of persons are sometimes erroneously overlooked, over pitied, or relegated and considered unfit for any serious educational program.

Special Needs Education also known as Special education is the practice of educating students in a way that accommodates their individual differences, disabilities, and special needs (Wikipedia n,d).?? This involves the individually planned and systematically monitored arrangement of teaching procedures, adapted equipment and materials, and accessible settings. These interventions are designed to help individuals with special needs achieve a higher level of personal self-sufficiency and success in school and in their community, which may not be available if the student were only given access to a typical classroom education. According to Wikipedia, Special education aims to provide accommodated education for disabled students such as learning disabilities, learning difficulties (such as dyslexia and attention deficit and hyperactivity disorders (ADHD), communication disorders, and other disabilities. Disabled

students are likely to benefit from additional educational services such as different approaches to teaching, the use of technology, a specifically adapted teaching area, a resource room, or a separate classroom. The most important mission of special education is to provide students with special needs with development opportunities and a learning process that will improve the quality of their life. This can only be done through the cooperation of schools and government institutions. The term Special Needs is a short form of "Special Needs Education"[1]("*UNESCO – Education – Special Needs Education*"; "*What It Means When a Child Has "Special Needs")* and is a way to refer to students with disabilities, in which their learning may be altered or delayed compared to other students,(nidirect., October 27, 2015). The term Special Needs in the education setting comes into play whenever a child's education program is officially altered from what would normally be provided to students through an Individual Education Plan, (Federation for Children with Special Needs. Massachusetts. 2022), which is sometimes referred to as an Individual Program plan, (Special education. British Columbia, 2009).

Thinking defined. How humans think dictates how humans feel and how humans react to situations in life. That, in turn determines one's success or failure. The APA full name ?? Dictionary of Psychology(2022), defined thinking as "cognitive behaviour in which ideas, images, mental representations, or other hypothetical elements of thought are experienced or manipulated". In this sense, according to APA (2022), thinking includes imagining, remembering, problem solving, daydreaming, free association, concept formation, and many other processes, *Thinking* is both a covert and a symbolic process that allows us to form psychological associations and create models to understand the world. It is considered a covert process seen as thoughts, and the processes behind their formation are not directly observable but inferred from actions or self-reports. It is understood as symbolic because *thinking* operates using mental symbols and representation. Thinking involves the deeply cerebral manipulation of information, as when we form concepts, engage in problem solving, reason and make decisions, (Psychology Wiki). Thinking has skills macro and micro which the brain uses to manipulate or process information gathered from the environment through the sense organs. Thinking skills are the mental activities you use to process information, make connections, make decisions, and create new ideas. We use our thinking skills when we try to make sense of experiences, solve problem, make decision, ask questions make plans, or organize information (thepeakperformancecenter.com/educational-learning/thinking) Thinking skills are necessary for everyday living. Real-life problems require these skills, without which, children often make hasty and thoughtless decisions, which results in ineffective and inappropriate solutions to problems. Thinking skills can be divided into three general areas (1) *Learning to learn skills*: These are general skills that apply to both school and non-school activities. For example, students are taught to monitor their attention levels, be aware of their attitudes, set goals, and so on. (2) *Content thinking skills*: These are specific skills that are designed to increase a

student's ability to learn specific content. Students are taught to recognize patterns, organize and summarize information, simplify complex tasks, etc. (3) *Reasoning skills*: Often described as "higher order thinking skills". Students learn how to generalize, apply, analyse, evaluate, draw inferences, etc., using several sources of information.

According to Pragati Kalive (in sociologygroup.com/types of thinking), there are three primary elements of thought - Concepts, Signs/symbols, and Brain functions. Concepts are ideas and notions that arise in the mind when we are presented with objects or information. For example, hearing the word "door", we would immediately think of the object alongside the concepts of protection, privacy, etc., that the door represents. *Signs and symbols* also represent and often substitute actual objects or ideas. The following x &? + <>, alphabets, numbers, etc., are signs/symbols that convey information to our brains. Lastly, the *brain* is the organ that performs the act of thinking. Whatever the brain registered from our sensory organs such as objects, sounds, signs and symbols in our environment, are interpreted in the brain to create thoughts (Pragati Kalive). The inability to think and to reason "normally" is what differentiates the Special needs from other human beings even though they have an innate tendency to utilize the information in their environment in order to deal with the complex challenges that they face. The way that a special needs individual approaches these problems and seeks solutions depends largely upon the manner in which their brain processes the information that it has been presented with, and how it was presented. The various ways in which our brain converts this information into thoughts can be understood as *Types of Thinking*.

The concept of "Higher Order Thinking" (HOT) connotes that at least two levels of thinking exist. Just as we have Higher order thinking, there is also Lower order thinking. Matching and multiple-choice questions on tests are examples of Lower order thinking which are prevalent in our classroom practices. This type of thought process regurgitates what the teacher has taught without requiring any effort of the child personally making sense out of the information. Certainly, parents want their children to maintain their natural sense of curiosity even with their disabilities, feel comfortable asking questions, examine problems and of course look for ways to solve problems on their own. It is natural to expect children become independent and think for themselves. If this is true, then it is necessary to engage higher order thinking skills in our classroom pedagogy and practices. In Bloom's taxonomy, recall and recognition as the lowest level of thinking while the highest two orders of Bloom's taxonomy are synthesis and evaluation. These types of thought processes are considered higher order thinking. Examples of such thinking is when test questions ask students to analyze, synthesize or evaluate and words like create, design, organise, judge or predict are used.There are several thinking processes that fall under higher order thinking, each demonstrates how the brain manages and processes information (Azman, T. 2022). The following are some of them - Perceptual or Concrete Thinking, Conceptual or Abstract thinking,

Critical thinking, Creative thinking, Analytical thinking, Evaluative thinking,Divergent and Convergent thinking. The way one person approaches problems and solutions depends more on *how* the brain manages and processes information rather than the facts presented. The thinking type students have adopted to work for them really dictates the quality of their outcomes, outputs, and future, (Azman, T. 2022; Thomas, J. 2018).

Perceptual or concrete thinking is the simplest form of thinking that basically uses human perception to interpret the information generated by human senses organs to create thoughts. It is also alternatively known as *concrete thinking* because human thoughts reflect human perception of concrete objects, exact interpretations or the literal meaning of language rather than applying other concepts or ideas to decipher the same information. *Conceptual or Abstract thinking* refers to an individual's ability to form thoughts about the information presented to them using complex concepts and ideas, (Pragati kalive in sociologygroup.com/types of thinking). Abstract thinking is a very important aspect of communication and social interactions as individuals can comprehend non-verbal cues, analogies and other symbolic representations as well as understand humour. The ability to think in this manner usually develops in late childhood and adolescence - Pragati. Furthermore, Pragati opined that an abstract thinker is able to relate seemingly random things with each other and make the connections others find difficult to see. They are able to form complex thoughts about theories, emotions and language such as writing or telling fictitious stories which make use humour, emotion, suspense, and rhetoric, in order to pass information.

Critical thinking is the analysis of available facts, evidence, observations, and arguments to form a judgement (Wikipedia). They believe that several different definitions exist, which generally include the rational, skeptical, and unbiased analysis or evaluation of factual evidence. According to Wikipedia, Critical thinking is self-directed, self-disciplined, self-monitored, and self-corrective thinking. It presupposes assent to rigorous standards of excellence and mindful command of their use. It entails effective communication and problem-solving abilities as well as a commitment to overcome native egocentrism and sociocentrism.*Critical thinking* is one of the most complex Higher Order Thinking Skills or Processes that requires macro cognitive skills and abilities such as reflection and reconstruction of thoughts and experiences to enable us comprehend, interpret, analyse, evaluate and make inferences in a clear and purposeful metacognitive (self-regulatory), unbiased manner. This allows critical thinkers to determine the authenticity, accuracy, value, logicalness, validity or worth of the information or something they are dealing with. Critical thinkers need to separate themselves from their learned prejudices and belief systems in order to ask vital questions that lead to the truth of a problem or issue. Critical thinking is imperative in Special needs education especially in this age of social media, when children consume online information, without thinking of the impact, implications and consequences.

Creative thinking is the ability to create something new and original, moving away from traditional or accepted thought patterns. Creative thinking is synonymous with 'thinking outside the box.' It's the ability to push past established thoughts, theories, rules, and procedures (The Balance Careers-2063744). It is to conceive new and innovative ideas by looking at things from a different perspective. Creative thinking is generating new ways of doing things - solve problems, devise new products and services, carry out tasks with new procedures, strategies, and meet challenges.

Analytical thinking breaks down information, weighs and assesses the relevance and logicalness of the facts. Those who think analytically have a structured and methodical way of approaching tasks. They are individuals with the ability to take something that is whole and separate it into basic parts to be examined. This makes them great at problem-solving.

Divergent thinking takes the path of exploring an infinite number of solutions to find one that is the most effective. So, instead of starting off with a set number of possibilities and converging on an answer, they go as far and wide as necessary and move outwards in search of the solution. In

Convergent thinking, a person will focus on finding one, well-defined solution. They will target these possibilities, or bring them together, to come up with a solution to a problem.

The problem of insufficient higher order thinking skills in special needs education has been identified and documented by researchers, revealing a good number of students with special needs unable to meet the demands of a changing, complex business community – Ibler, Leslie S. (1997). It is difficult to believe that there are teachers who are not aware of the importance of teaching higher-order thinking skills to prepare young people to live in the 21st Century. Nevertheless, the extent to which higher-order thinking skills are taught and assessed continues to be an area of debate, with many teachers and employers expressing concern that young people 'do not think' at a higher level. Several educators are in agreement that students recently graduating from educational institutions lack higher order thinking skills necessary for problem solving and decision-making processes (Ebeling, Moore, & Rieth, 1993). Educators also believe with the tremendous amount of new information available to the public on a daily basis, that higher order thinking skills will be needed to help individuals sort through and make sense of it all (Gough, 1991). This may in part explain the increased interest in teaching higher order thinking skills.Ibler, (1997) report described a project designed to expand higher order thinking skills in five primary students with disabilities in order to increase problem solving and decision-making skills. The project incorporated higher order thinking skills into mathematics, science and language arts units, and implemented weekly, cooperative learning techniques and activities. Following the introduction and modeling of a specific thinking skill, students practiced the skill in a content-free cooperative group activity. Eventually, skills were imbedded into a structured mathematics, science, or language arts

lesson, where students could demonstrate their understanding of the skill as well as use its application for problem solving. Results of the intervention indicate improved student conduct, successful problem solving in language arts and science, an increase in student use of higher order thinking skills, an improvement in written and oral expression, and a heightened ability to participate more fully in a cooperative group effort while substantiating their ability to use appropriate social skills. In the same vein, Rhashvinder K. A. et al (2017), in their in-dept review of literature on the teaching of higher order thinking skills to teach writing in Malaysian context, opined that teachers are only trained to ask Higher Order Thinking Skills questions where the teaching of writing is concerned but most of them have very little knowledge on implementing the pedagogical knowledge of higher order thinking skills.

The thesis statement of this chapter is based on the fact that PWDs education is largely characterized by low order thinking skills as against the Higher order thinking skills which are the high demand skills in the 21st century. In this chapter, the following will form the main discussion based on research reports.

1. Nature of Higher Order Thinking
2. Processes/ Procedure
3. Impact of HOTS on the Special Needs
4. Challenges

1. The Nature of Higher Order Thinking

Higher order thinking skills include critical thinking, problem solving, decision making, and creative thinking (Lewis & Smith, 1993 in Rhashvinder et al, 2017). According to Dewey (1933), thinking does not occur spontaneously but must be "evoked" by "problems and questions" or by "some perplexity, confusion or doubt." Brookhart (2010) in Robyn Collins, (2014) identifies definitions of higher-order thinking as falling into three categories: (1) those that define higher-order thinking in terms of *transfer*, (2) those that define it in terms of *critical thinking*, and (3) those that define it in terms of *problem solving*.

In the category of *transfer*, Anderson, Krathwohl et al (2001) defined transfer in how it differs from retention: *Two of the most important educational goals are to promote retention and to promote transfer (which, when it occurs, indicates meaningful learning) …retention requires that students remember what they have learned, whereas transfer requires students not only to remember but also to make sense of and be able to use what they have learned in other settings*. While learning for recall requires thinking, the higher-order thinking is in 'transfer'. That is, students not only acquire the knowledge and skills, but also can apply them to new situations. It is this kind of thinking, according to Brookhart (2010), in Robyn Collins, (2014), that applies to life outside of school where thinking is characterised by 'a series of transfer opportunities, rather than as a series of recall assignments to be done'.

The *critical thinking* category includes definitions that refer to 'reasonable, reflective thinking that is focused on deciding what to believe or do' (Norris &

Ennis, 1989), and 'artful thinking', which includes reasoning, questioning and investigating, observing and describing, comparing and connecting, finding complexity, and exploring viewpoints (Barahal, 2008 in Robyn 2014). In critical thinking, being able 'to think' means students can apply judgment or produce a reasoned critique. One of the goals of teaching is to equip students by guiding them towards how to make sound decisions and exercise reasoned judgment. The skills students need to be taught to do this include: ability to identify assumptions, the ability to judge the authenticity and credibility of a source; ability to generalize; identify biases and identify connotations in language use; understand the purpose of a written or spoken text; identify the audience; and to make critical judgments about what to believe before making effective decisions; ability to evaluate the relative effectiveness of various strategies; ability to use metacognitive skills for self-awareness and self-monitoring.

In the *problem-solving* category Brookhart provided the following definition: *A student incurs a problem when the student wants to reach a specific outcome or goal but does not automatically recognize the proper path or solution to use to reach it. The problem to solve is how to reach the desired goal. Because a student cannot automatically recognize the proper way to reach the desired goal, she must use one or more higher-order thinking processes. These thinking processes are called problem solving* (Nitko & Brookhart, 2007 in Robyn Collins, (2014). They include remembering and application of previous information, clarity and understanding of concepts, signs and symbols, critically evaluating ideas, formulating creative alternatives, and communicating effectively. The broad definition of problem solving is that it is the skill that enables a person to find a solution for a problem that cannot be solved simply by memorising (ibid). Bransford and Stein (1984) point out that problem solving is the general mechanism behind all thinking, including recall, critical thinking, creative thinking, and effective communication. They assert that to recall something, students have to identify it as a problem and devise a solution that works for them.

It is important to teach students to think about their own thinking processes. When these skills are nurtured and well developed, one can perform better during explanations and making decisions as well as growing intellectual skills. Development of higher order thinking skills, relies on their lower level thinking skills thus making higher order thinking skills grounded with lower level thinking skills. According to King (1997), the ability of higher order thinking skills is activated when individuals encounter unfamiliar problems, uncertainties, questions, or dilemmas. To be able to think critically, prior knowledge of subject matter or content is necessary. Higher order thinking (HOT) is active thinking rather than passive acceptance of facts. HOT takes thinking to higher levels than restating the facts and requires students to do something with the facts, that is, to break them down, understand them, draw conclusion from them, apply them to other facts and concepts, categorize or classify them, manipulate them, synthesize them in new ways or innovatively, and apply them to every area of our needs,

questions, gaps and problematic situations.HOTS involves critical thinking, creative thinking, include the skills of synthesizing, analyzing, reasoning, comprehending, application, and evaluation.

2. Processes / Procedure

Just as there is no single way to solve a problem, the same can be said about choosing the best possible solution to teaching higher order thinking skills to students. There are many diverse ideas being suggested by experts in the educational field, but what educators seem unable to agree upon, is the best approach to use when teaching higher order thinking skills. While Bloom's Taxonomy is not the only framework for teaching thinking, it is the most widely used, and subsequent frameworks tend to be closely linked to Bloom's work. A committee under the leadership of Dr Benjamin Bloom created the Taxonomy in 1956. Bloom's aim was to promote higher forms of thinking in education, such as analysing and evaluating, rather than just teaching students to remember facts (rote learning). Learning was divided into three domains of educational activity: Cognitive: mental skills (*Knowledge*); Affective: growth in feelings or emotional areas (*Attitude or self*); Psychomotor: manual or physical skills (*Skills*) While all three domains are important for a sound and rounded individual, it is the first domain (Cognitive) that is the subject of this chapter. The cognitive domain involves 'knowledge and the development of intellectual skills' (Bloom, 1956). The abilities and skills within the domain are listed in six major categories starting from the simplest thinking behaviour to the most – (Knowledge, Comprehension, Application, Analysis, Synthesis, Evaluation) which were reversed to – (Remembering, Understanding, Applying, Analyzing, Evaluating. And Creating) by Lorin Anderson (2000), using verbs in place of nouns by Bloom. It is generally accepted that each behaviour needs to be mastered before the next one can take place. This is useful knowledge in assisting teachers in planning their lessons.

In reviewing the literature, one other approach some experts feel has merit is the teaching of higher order thinking skills outside of the regular classroom as a separate program and not content specific. One such program is known as the Higher Order Thinking Skills program (HOTS). It was created by Dr. Stanley Pogrow of the University of Arizona in Tucson, for the purpose of addressing the problem of 'at-risk' students who lacked basic thinking skills (Pogrow, 2005). The literature explains that transfer of learning, language fluency, self-confidence, and thinking skills of students improved through the use of the Socratic method coupled with computer usage (Pogrow, 1988 in Idler, 1997). The HOTS program additionally focuses on the areas of metacognition (thinking about ones thinking), inferences from context, and decontextualization (transfer of learning). These elements are significant to the development of critical thinking skills and problem-solving skills in students. Pogrow's HOTS program has proven to be successful not only with at-risk children but also with most students who have learning disabilities. This has practical application to serve many students in special education programs and is adaptable for use at the primary, middle, and high

school levels. As with the HOTS program, and other separately conducted higher order thinking skills programs, the need for student-to-teacher interaction is vital to the successful teaching of these skills. Paul (in Lombardi & Savage, 1994) has noted that verbal interactions between parents and their children have declined, and as a result many children come to school with limited language experiences and have not been exposed to good language and thinking models to assimilate. For these reasons, some experts believe that the solution to improving higher order thinking skills of students is in allowing them to talk more in class. Other processes of teaching higher order thinking skills include:

1. "**Real talk time" in the classroom**. Students are provided the opportunity to converse more frequently in a classroom situation, that their vocabularies and critical thinking skills will improve because of the social nature of conversation. It is through communication with others that one learns the art of self-expression. It also allows teachers to model their thinking for students. In turn, students benefit by listening to other points of view, suspending judgment, extending their vocabulary by learning new words, expanding their knowledge base, and becoming reflective thinkers.

2. **Creation of conducive classroom climate conducive learning and thinking.**. This approach emphasizes creating conditions for thinking which are inviting and comfortable. There must be a non-threatening appeal to encourage higher order thinking spawned by carefully developed questions, since this approach does not directly teach thinking skills. Besides creating a climate to foster thinking, teachers using this approach to improve higher order thinking skills make use of wait-time. This is sometimes called "the pregnant pause" (Willis, 1992). The idea behind the concept of wait-time is not to rush the students to respond, but to afford them the opportunity to reflect upon what has been asked, reflect upon their own thinking about the topic, and then share their response. For this reason, it is critical that the teacher ask thought provoking questions which require students to be reflective thinkers capable of supporting their answers and explaining their thinking. The establishment of a risk-free learning environment is critical to the success of any educational program. Students need to feel confident that the experiences they share, their opinions, and ideas will be accepted, valued, and welcomed. To reassure students that their input will be respected.

3. **Cooperative learning**. It is the suggestion of Rhoades and McCabe (as cited in Costa, Bellanca, & Fogarty, 1992) that higher order thinking skills be taught through the process of cooperative learning because of the natural inclination to share one's thinking in this group effort. Students come to their cooperative group with a particular frame of reference. The frame of reference, according to Rhoades and McCabe (as cited in Costa, Bellanca, & Fogarty, 1992 in Idler, 1997) are "the sum total of each individual's experience and knowledge." As students acquire additional knowledge from cooperative group activities and interactions with peers, they attempt to assimilate new information and connect it to past experiences thus creating what Rhoades and McCabe refer to as "thinking paths." In addition to

the benefits of teamwork, sharing, caring, and learning that cooperative learning scenarios provide, students are able to share their thinking. In this way, students are able to contribute to the thinking paths of their classmates, and because students often have some similar experiences, assimilation should be attainable. During cooperative group activities, students share their thinking to help group members understand concepts or see how someone arrived at a conclusion. Just prior to the completion of cooperative learning activities, students are guided by their teacher to reflect upon (think about) not only the activity, but also upon their own thinking. This thinking about one's own thinking (metacognition), is a critical aspect of higher order thinking. Specifically, the use of cooperative learning as a means to teach higher order thinking skills supports Vygotsky's thinking. Vygotsky (as cited in Gore, 1991), suggested that "in order to integrate problem-solving into the cognitive structure of the mind, it must first be practiced in social settings.

4. **Infusion**: This is one of the most agreed upon methods to teaching higher order thinking skills. This occurs when students are given direct thinking skills instruction within the content matter of an already established curriculum (Willis, 1992). Several researchers and educators believe thinking skills should be taught explicitly and that infusing those skills into the content of the curriculum helps to facilitate the transfer of learning for the student. More than thirty decades ago, Fraenkel suggested thinking skills could be taught and that all children were capable of thinking at abstract levels even if the quality of thinking was different. Additionally, he expressed his belief that content areas offered opportunities to practice thinking skills and students could be taught strategies to improve thinking skills (Lombardi & Savage, 1994). Barry Beyer developed and later revised his own set of ideas based on Fraenkel's research. Beyer simplified his method into four steps to assist teachers in explicitly teaching students various thinking skills. The four steps included introducing, explaining, demonstrating, and applying the thinking skill (Lombardi & Savage, 1994).

5. **Graphic organizers/ Concept maps**: The use of graphic organizers/ concept maps provides students a way to record and organize their thoughts and enables them to "see" their thinking and use the visual representation to show or explain their thinking to others.

6. **DOVE**: This is a set of guidelines which dictate appropriate conduct during discussions and in cooperative groups. The "D" in DOVE stands for defer. Students are asked to defer their judgments. They're not to be negative toward others' ideas and not criticize in a demeaning way. The letter "0" refers to opting for the off-beat or original ideas. The "V" stands for vast number of ideas or a variety of ideas. The "E" means expand. The idea is to expand the number of ideas by jumping on the ideas of others. This is known as "piggybacking" (Bellanca & Fogarty,1987 in Idler, 1997).

3. Effects Of Hots On The Special Needs

Reports reveal that teachers feel teaching higher order thinking skills and problem-solving skills are very important, as student are able to solve their own problems when possible. Students improve in responsibility and accountability, achieve a certain level of independence in their lives and learn how to be good citizens. Teaching the skills of good citizenship, responsibility, and accountability are of great importance to special education students as students functional skills and skills that will help them become productive citizens are learnt and applied. It also seem reasonable that special education teachers are helping students to increase their self-esteem by teaching them skills to foster their independence. Certainly, as students learn to solve their own problems through higher order thinking, they are better able to internalize taking responsibility for their actions and understand the concept of being held accountable. In all according to Ibler (1997) students are provided with skills which might promote a positive integration and smooth transition into the mainstream of society. Student Behavior, Student Self-Esteem, Student Responsibility and Accountability, Problem Solving Skills of Students, Class Participation, Social Skills of Students, Thinking Skills of Students, Transfer of Learning, Student Involvement in their Education improve.

4. Challenges

- It is observed that there is scarcity of current literature on the topic "engagement of Higher order thinking skills in Special Needs Education". This is a challenge to curriculum evaluators and educators.
- Review of literature reveals that teachers are faced with the problem of how to prepare and teach higher order thinking skills in different fields (Idler, 1997; Rhashvinder et al, 2017). Although gradual sensitization is ongoing in terms of the need for teachers to engage the special needs in HOTS, teachers have not been adequately trained by professionals, therefore, they are not fully prepared for the task. You can't give what you don't have.
- Special Needs Education curriculum designers and the ministries of education seem to have neglected the explicit infusion of the higher order thinking skills into the curriculum. This could be an oversight or a case of underrating the special needs abilities, thus resulting in an enriched curriculum deficiency.

Summary

Conclusively, research has shown that special needs can learn, transfer and apply the higher thinking skills when adequately taught in a conducive climate, and that, student motivation increases when teachers hold them accountable for higher-order thinking. This seems to be so, because teaching students higher-order thinking tasks forces them to engage in thinking about things concretely conceptually. Memorising, while it is useful in some cases, does not increase students' autonomy and, to a large extent, does not contribute to mastery, although

it might be argued that knowing basic facts is essential in providing building blocks for understanding. Researchers opine that every child needs to improve on the higher order thinking skills because it is crucial for life to interact and compete globally whether with Special Needs or not. In the school environment, special needs children can develop abilities and skills in the sphere of knowledge acquisition, character and attitudinal development, as well as life skills as individuals and members of a society, when given required support by the active roles of teachers. An important product of education is the ability and disposition to solve problems - personal and societal, and that education is meant to bring about emancipation and transformation and when it fails, it becomes an agent of mental confusion and slavery (Ogbe, 2019). It is imperative therefore according to Ogbe, (2019), that teachers teach Content/subject matter asa system of thinking. With the right classroom climate, students not only practice higher order thinking skills, but practice the necessary social skills one needs to interact appropriately in a cooperative group discussion and this builds on Metacognition, or the thinking about one's own thinking. There is transfer of learning as both learning and teaching are all about transfer, being able to bridge the old knowledge with the new, and the past with the present, in an effort to achieve a better future.

Suggestions

- The engagement of Higher Order Thinking Skills, should be addressed as a matter of urgent need by Special Needs Education curriculum designers, researchers, personal and classroom teachers and the ministries of education.
- Specifically, instruction should be redesigned to reflect critical thinking, creative thinking conceptual, technical, aesthetics, constructional and even marketing areas, in order for Special Needs students to develop creatively.
- Higher order thinking skills should be an integral part of teaching and learning at all levels of education and teachers should be given adequate training by professionals.
- Higher order thinking skills should be explicitly infused and embedded in the school curriculum content. Thinking skills lessons should be a part of the curriculum if students are to think and solve problems individually; cooperatively and creatively.

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