

Metacognitive and mediated learning in visually impaired

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ABSTRACT

In the educational paradigm, current transformations focus on the transition from the traditional learning to an interactive and in-depth learning. It requires redefining the concept of learning, meeting the current needs of the knowledge of the society and restructuring approaches to knowledge in academic disciplines. Effective learning is possible when a person understands his or her cognitive performances. Metacognitive knowledge relates to what individuals know about their own cognition and includes knowledge or beliefs about what factors and variables act and interact to influence in some way the course and results of approach to knowledge. In general cognition refers to metacognitive activities that help control their own thinking and learning. Visual impairment has an effect on the development of cognition which includes many areas such as training concepts about the world and objects, memory, thinking, problem solving and creativity. Thus, the present study focuses on the metacognitive strategies along with the mediated learning used for the visually impaired individuals to improve learning. The qualitative study has used exploratory research design including 13 visually impaired school population and 7 educators. A semi-structured interview protocol was developed and participants were asked about the mediated learning principles that are administered in special education and how it helps the students to improve their metacognition.

Keywords: Metacognition, Mediated Learning and Visually Impaired

Metacognition, the knowledge and regulation of our cognitions, is an essential part of our learning. Metacognition has been linked to academic performance at all levels of education. Metacognition is a regulatory system that helps an individual in understanding and controlling his or her own cognitive performance. Thus, people use different metacognitive strategies in helping themselves understand the way they learn or to think about their own thinking. Learners often show an increase in self-confidence when they build metacognitive skills. "Awareness of their own thinking, awareness of the content of their concepts, active monitoring of their own cognitive processes in relation to learning and applying a set of heuristics such mechanisms effective, designed to help the individual to organize their own methods of attack / approach / solving problematic situations in general" (Hennessey, 1999). Schneider (2008) considers that "this concept refers to knowledge that people have about their own abilities to process information and knowledge

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about the nature of cognitive tasks and the strategies used to cope with such tasks. Moreover, it includes also the executive powers relating to monitoring and self-regulating their cognitive activities". Metacognition is a complex but valuable skill that can nurture students' learning and their self-awareness of the learning process. When comparing the current educational paradigm, the visually impaired students require mediated learning for the development of understanding the concepts of the world. According to the Good Information Processing Model by Pressley, Borkowski & Schneider (1989), metacognition is closely interrelated with: learning strategies and the use of automated processes for effective learning that the student uses motivational orientation, general knowledge about the world. (Schneider, 2008). Metacognitive activity is essential in the strategic application of metacognitive knowledge to achieve cognitive goals. It enables the regulation and control of cognitive processes.

In forming concepts, vision plays an important role by motivational functions, stimulating and inclusive. In terms of blindness, a child may have great difficulty in perceiving using tactile - kinesthetic and other senses an object in its entirety. (Preda, 1993). Cognitive skills are likely to grow more slowly or in a different way to visually impaired children than those without visual impairments. These skills include many areas such as training concepts about the world and objects, memory, thinking, problem solving and creativity. Visual impairment involves general restrictions, each of which effects the development of cognition: the variety of experiences, the ability to control the environment, the ability to self in the environment. Many researchers have argued that the concepts cannot be developed without the intervention strategies planned by the teacher which combines the firsthand experiences in exploring objects with verbalization of issues that cannot be perceived visually. Theories of development using Instrumental Enrichment Programs adapted to different categories of deficiencies, insists that children learn and develop their intelligence under the impact of intensified teaching strategies, formative and stimulating. When we talk about educational process in children with visual impairments include here and specific ways of teaching - learning, so learning the special conditions can be successfully achieved by adapting teaching style by teachers and given a number of factors such as: location, presentation, experience, Expectations, Providing information, speed. (Chapman & Stone, 1998).

The universal right to education was officially established in 1948 by the United Nation General Assembly through the Universal Declaration of Human Rights. Article 26 declares that: Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms. It shall promote understanding, tolerance and friendship among all nations, racial or religious groups, and shall further the activities of the United Nations for the maintenance of peace.

Mediated learning is the process of physical and social environment is mediated child by a competent person who enriches the interaction between child and environment elements that do not belong to the concrete situation, but part of a world of meanings and intentions derivation from a variety of values, attitudes, goals and means of transmitting culture (Feuerstein, 2000). The mediator in the relationship between the body and the universe stimuli learn to interpret, guide and give them meaning. . In such interaction, the learning is intended. Thus, the visually impaired acquires the delay in learning, analytical perception of reality and temporary obstacles in learning through mediated learning process. This study focuses on the development of metacognitive strategies in learning with the assistance of mediators among visually impaired students.

Statement of the problem

According to UNESCO report of the year 2000, there are around 30 million children in India suffering some form of disability, among India's 200 million school-aged children (6-14yrs), 20 million require special needs education. While the national average gross enrollment in school is over 90%, less than 5% of children with disabilities are in schools. The Indian government and NGOs are however initiating measures to review and plan appropriate strategies for special needs and inclusive education. In the traditional pedagogy passive learners do tend to be not confident and knowledgeable in their performances. This increases the need for improvising new method of education through mediated learning to focus on every single learner effectively. Many studies have found the metacognitive knowledge in learners, how it helps in the development of vocational training and employment. Thus, this study focuses on the mediated learning principles used by the mediators in improving the learning and the metacognitive strategies used by the learners in the effective process of learning.

Purpose of the study

This exploratory study is to understand the students' perceptions of their metacognitive activities, and metacognitive strategies used by the visually impaired students and to investigate the mediated learning process used by the educators in teaching the students. To achieve these goals, the study will use data gathered through individual interviews and thematic analysis. Visual impairment is defined in IDEA (IDEA, 2004) as "visual impairment including blindness means impairment in vision that, even with correction, adversely affects a child's educational performance. The term includes both partial sight and blindness". The study includes the effective learning strategies that helps students both partial and pure blind students and helps in understanding the necessity of implementing advanced methods of learning for improving the metacognitive awareness in the visually impaired. To identify the challenges faced by the students in learning and mediators in teaching the visually challenged during mediated learning. This study also focuses on the metacognitive strategies used by the students in reading.

Significance of the study

This study is significant and essentially important to investigate the mediated learning principles used by the educators and pays attention towards the metacognitive strategies used by the learners both partially sighted and purely blind in reading. Cognitive development of children who are visually impaired shows some lag in various aspects of abstract thinking such as conservation, mental rotation, and reasoning. This study aims to increase our knowledge on the tactics used by the visually impaired students in improving learning process. It is also an attempt to include visually impaired into educational research.

Definitions

Metacognitive strategies refer to the methods used to help students understand the way they learn; in other words, it means processes designed for students to 'think' about their "thinking". Metacognition pertains to the knowledge and skills for organizing, guiding, and controlling one's own thinking, actions and learning processes. Metacognitive strategies are sequential processes that one uses to control cognitive activities, and to ensure that a cognitive goal (e.g., understanding a text) has been met (Livingston, 1996).

Mediated learning is an intervention program composed of Learning Propensity Assessment Device and instrumental enrichment. This aims at teaching a person how to think and how to

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scrutinize their thinking faculties so that they can independently change, adapt and learn in any situation.

Visual Impairment: Any chronic visual deficit that incapacitates everyday functioning and it cannot be corrected by ordinary eyeglasses or contact lenses (“APH: Blindness Basics,” n.d.). Visual impairment is defined in Individuals with Disabilities Education Act (IDEA, 2004) as “visual impairment including blindness means impairment in vision that, even with correction, adversely affects a child’s educational performance. The term includes both partial sight and blindness” (“IDEA - Building the Legacy of IDEA 2004,” n.d.)

METHODOLOGY

Research questions

1. What are the assistive learning methods used in the educational paradigm for the visually challenged and the impact of these learning principles in learners?
2. What are the challenges faced by the visually impaired in learning?
3. What are the effective metacognitive strategies used by the learners in reading?

Setting

Qualitative research involves the researchers studying the participant in their natural setting (Cresswell, 2007). In this case the natural setting includes the home and the schools or the work place. Qualitative research was preferred because it allowed the researchers to interview the participants in either assisting or facilitating learning to the visually impaired student. The researcher visited the students at their schools and home and interacted with them and the educators were interviewed at their workplace. Data were collected through audio-taped semi-structured interviews and observation method.

Population

We used purposive sampling technique to identify the participant in this study. The participant is a visually challenged student and their educators who were directly involved with assisting the students during the learning period. The purposive sampling technique enabled the researchers to pick individuals with the vital information to ensure relevant data would be collected (Creswell, 2007). For the present study includes participants of 13 visually impaired students of ages 14- 16 years and 9 educators which included both visually impaired and sighted from special schools in Calicut, Kerala. The participants were both male and female; there was no deliberate attempt on my part to seek or explore distinctions between these groups. This includes partially sighted and visually impaired students and 4 purely visually impaired educators and 3 sighted educators.

Research design

This is a small-scale qualitative research study using exploratory research design.

Data analysis

“Data analysis is the process of making sense out of the data. And making sense out of the data involves consolidating, reducing, and interpreting what people have said and what the researcher has seen and read” (Merriam, 2009). The data collected from the participants through semi structured interview and observation methods are transcribed verbatim, analyzed and interpreted to generate meanings and themes out of the data. After each of the interviews had been coded for these sub-themes, the data was then re-analyzed, identifying cross-over between sub-codes, and identifying patterns forming between the themes. Observations were made during the learning process. The thematic study analysis was used

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to analyze the data. During data analysis the following steps were followed coding, categorizing, the researcher had to structure the categories of data so that they would be meaningful. Analysis also involved selecting the categories and relating them to other categories.

FINDINGS AND DISCUSSION

Assistive learning methods used in teaching visually impaired

Theme1: Mediated learning experience of students

	Response of the students
Intentionality and reciprocity	76%
Meaning mediation	92%
Transcendent	46%
competence	61%
Self-control and control of behaviors	53%
participation	92%
Encouraging curiosity	76%

In this present study, the educators and students have responded to questions relating to mediated learning process. It is clear from the above data that the teachers encourage the students in asking relevant questions in the class. They promote the visually impaired children in understanding and forming the concepts by explaining them beyond the situation. The findings show that (46%) the concept formation is not explained beyond the situations. Since the students are following the same textbooks as that of sighted individuals, they might find it difficult to understand the different concepts. The vast majority of concepts in learning are formed through visual sensations, thus the concept formation is delayed in visually impaired individuals.

However, 92% of individuals have been promoted to ask questions in classroom. The students are being asked about the future and previous lessons. They always promote the students with a positive feedback and motivate them to ask why and how questions. They identify the skills each student has and facilitate them to use these skills in many situations. The teachers use different practices to help the children learn complex new tasks by decomposing them into simpler ways.

The students are being asked to share their experiences in the class and support active participation among their companions in the classroom setting. The students are being persuaded to hold on their own individuality in the form of their original thinking and encouraged to use their leisure time effectively. They also assist the individuals in developing innovative ideas or works. Accent the positive aspects of multiculturalism and respect the right of every student to be different and do not require students to complete assimilation own beliefs and values. Cultivates the desire and the capacity of students to set realistic goals, encourages perseverance and patience to an end, shape their behavior goal-oriented setting clear objectives for each lesson and for learning in general; encourages autonomy of students about their future prospects. Teachers involved in the study stated that always encourage intellectual curiosity of students, originality and creativity, provide students new and complex situations. Teachers report that they always form the students an active learning - a good classroom management, encourages self-discipline and perseverance in class activities.

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Thus, both the visually impaired and sighted educators support and promote learning in individuals through mediated learning. But even then, the visual limitation is not being able to overcome which in turn affects the mediated learning experiences in classrooms. The finding in competence shows that students do face difficulty in learning complex tasks. Santin and Simmons (1977) maintained that students with severe visual impairments construct reality differently than sighted students because of limited visual input and this difference will affect problem solving and reasoning strategies. Boldt (1969) found that although cognitive development of children who are blind developed similarly to that of sighted children, blind children's ability to process complex auditory material showed a tremendous lag until about age 16 or 18 and this situation makes them follow their sighted peers from several years behind (Barraga & Erin, 2001).

Theme 2: materials and teaching strategies used by mediators in visually impaired

The learning strategies theme was particularly relevant to understanding the application of metacognitive awareness. It includes changes in the implementation of appropriate strategies to improve learning. For visually impaired students the Braille textbooks have been used. Braille is a tactile writing system used by people for written communication.

When teachers were asked if the ability to learn Braille differs in individuals, they suggested the test they administer a child before teaching the Braille to know the ease at which the child is able to learn. The test includes the pre-Braille skills. Base on the three factors such as muscle coordination for the mobility orientation, tactile sensation ability for the Braille differentiation and absence of any other disabilities.

The above study reveals that the visually impaired students do follow the same syllabus as in other schools but the teachers do modify the curriculum in order to meet the needs of the students. The teachers also revealed the use of certain metacognitive strategies to help students understand the way they learn. They stated that it is through reading the child improves the thinking skills necessary for the cognitive development. Truly comprehending reading involves students actively engaging with text and accurately deciphering the layers of meaning. Teacher also provides knowledge through embossed maps and models. By providing the models the students are able to create a mental construct about the objects and concepts.

In learning mathematics, the students used abacus and Tyler frame. This would help them to learn the basic mathematics. To improve their effective learning process the students are asked to make questions regarding the respective topics. Along with they also learn information technology with audio assistance. The teachers stated that at the age of 13 or above the students are being provided with inclusive education. The special school is preparatory centre for the child to live in a social world. Since the sighted learn majority of learning through observation or imitation at younger ages. They are been taught the essential life skills at their schools and homes.

The teaching process also includes providing tactile learning experiences for visually impaired whenever possible and in other cases they usually follow oral instructions. Aids and assistive technologies provide them the better understanding of what is expected. The students record their lessons which help them to listen to instructions and lessons multiple times.

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Challenges faced by the visually impaired in learning

	Visually impaired respondents	Partially-sighted respondents
They face difficulty in reading and writing	22%	75%
Face the issues of time management during class sessions and exam	88%	75%
Face difficulty in forming concepts initially	77%	50%
Face challenges in daily life skills	88%	25%

The students and educators were asked to highlight the problems visually impaired face in the educational setting. The partially blind students find difficulty in learning Braille. Since these children were primarily taught in normal schools and the parents were unable to do detect their low vision. The partially blind face a lot of difficulty in reading and writing as they lack in Braille skills. The students also suggested the following possible solutions to the problems faced. The student needs assistance with reading materials to meet the course requirements. In the area of lesson library resources, the student came up with a number of suggestions which: “the students had this to say, e- books, current library books, audio books and tapes and compact disks. The library also needs new technology for students who are blind. They are given additional assistance in learning Braille.

When compared to the sighted students in inclusive educational settings the visually impaired face a problem in the time management. They require more time in coaching with the subjects and they find it difficult. *During the lectures I find it difficult to follow up as fast as my fellows.* They use contractions to overcome this problem. Learning to form contractions of lectures probably helps the individual but they do face issues of writing during exams. They also accomplish more time in class works.

The students suggested in forming new concepts partially blind finds it easier comparatively to the pure blind children. This is due to the partial vision possible they move around and learn many concepts through observations. Visual sensations assist them in forming their concepts which is completely absent in visually impaired. They do face challenges in their daily life skills and it impairs their social life. Partially impaired doesn't face issue with mobility and further life skills are developed in them.

When the teachers were asked about the challenges they face as a mediator in teaching visually impaired. They responded that school does not have advanced teaching and learning material to aid the teaching and learning of students with visual impairment. The schools are not in a position to spend lots of money on purchasing the expensive gadgets that would serve hardly a third of the population of the students' body. Many countries have been using various enrichment programmes and interventions for the better and advanced learning of visually impaired. In Kerala, the special schools do teach the basics rather than focusing on the in-depth learning of individuals. The lack of trained teachers for various advanced interventions is also a demanding issue for the learners. While teaching the students they may also face issues with the time management. Students with visual impairment need extra time for coaching in the subject that they find it difficult to understand and teachers need not only to be trained in skills acquisition but also to be motivated to go an extra mile in assisting the needy students. The teachers also stated that the early detection of visual impairments probably would help the individuals to get acquainted to the issues of learning such as Braille which is essential for the reading and writing.

Metacognitive strategies used in reading

The students who are completely visually impaired preferred reading compared to that of partially blind. The study found that the students use different metacognitive strategies for reading. They have knowledge of what they would be reading; this is an attempt to activate their prior knowledge. They visualize the text in their minds. The Braille is minute and requires attention to differentiate the letters. Then the tactile sensation facilitates the individuals in reading the letters and combining them to form meaningful words. After reading they usually understand the important information present in the context. This enables them to ask questions and summarize the content. They however use the planning strategies and monitoring strategies to facilitate their learning process. Since the visually impaired expedite their learning process mainly through reading and writing, these strategies play a vital and inevitable role in accessing knowledge. This knowledge is further examined through evaluation process and based on the anticipation of the use of knowledge they hold.

Implications

This study is hoping to provide an insight into the process of learning and understanding the assistive methods used for the individuals to facilitate an adequate education. It also addresses the problems faced by the visually impaired students and also the problems mediators faced in teaching them. The blindness is a limitation and all these assistive methods are used to reduce the effect of this limitation and help the people to function like a sighted individual. This study also focuses on the necessity of providing new and advanced interventions along with the basics of learning. The inclusive education helps the individual in increasing their social skills and along with it the trained teachers are required to overcome their limitations in education.

New policies are to be provided for the purchase of gadgets and teachers with knowledge of advanced technologies has to be ensured in the special schools. The students have to be provided with ample opportunities for understanding the concepts. The study also reveals the necessity for the early detection of low vision in individuals so that it might enable them to function and learn properly.

CONCLUSION

This study concluded that the visually impaired student function adequately with the assistance of their mediators. The metacognitive strategies used in reading helps the child to understand and access their knowledge which promotes and improves their performance in learning. The problems faced by the partial and fully visually challenged enables the need for early detection technologies and assessment of new interventions.

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Conflict of Interest

The author declared no conflict of interest.

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