CHAPTER I

INTRODUCTION

1.0.0 INTRODUCTION

One subject that is necessary to all the Mathematics is mathematics. It is the main vehicle for developing students' logical thinking and higher-order cognitive skills since it plays a major role in a number of other scientific fields such as physics, engineering, and statistics. With these connections, strong understanding and good achievement in mathematics of the students are required and necessary.

Many interventions are positively linked to the mathematical performance of the students and one of which is the self-regulated learning (SRL) strategies. According to Zimmerman (2008), self-regulated learning (SRL) is one of the determinants of performance of the students. It is an academically effective form of learning through which the learner set goals and make plans before starting to learn; monitor and regulate his/her cognition, motivation and behavior during the learning process; and reflect on his/her learning process.

With this, the researchers look for other variables that will influence the relationship between self-regulated learning strategies and these are students' deferred gratification, engagement in mathematics, and their attitude towards mathematics. The researchers believe that these three variables are also associated with the causal relationship between SRL strategies and mathematics achievement of class IX students.

This study determines the effect of self-regulated learning for teaching mathematics to class IX student of Balasore district.

1.0.1 ELEMENTS OF SELF-REGULATED LEARNING

Effective learners are self-regulating, analyzing task requirements, setting productive goals, and selecting, adapting or inventing strategies to achieve their objectives. These learners also monitor progress as they work thorough the task, managing intrusive emotions and waning motivation as well as adjusting strategies processed to foster success. These are the students who ask questions, take notes, and allocate their time and their resources in ways that help them to be in charge of their own learning (Paris & Paris, 2001).

1.0.2 STATEMENT OF PROBLEM AND SUB-PROBLEMS

Although researchers define self-regulation in a variety of ways, most are similar to Zimmerman's (2002, p. 65) definition, which states that self-regulation is the "self-generated thoughts, feelings and behaviors that are oriented to attaining goals." Self-regulated learning strategies are those skills and behaviors that students use independently to enable them to reach the learning goals they have set for themselves. The problem is that all students are not knowledgeable about a variety of strategies, how to determine which strategies are most effective for a given task, or how to monitor their progress based on the strategies they have decided to utilize. In most middle grades and high school mathematics classes, the focus of instruction is on mathematics content, as it should be, but without including explicit instruction on the use of self-regulating learning strategies, students may not have all the skills needed to be successful, independent, self-regulated learners. In this research we will study that "Effectiveness of Self Regulated learning for teaching Mathematics to class IX students of Balasore District".

There are several sub-problems associated with including instruction on the use of self-regulated learning strategies in middle grades mathematics classes, which is the setting for this study. First, teachers are not generally aware of self-regulated learning strategies. There doesn't appear to be a finite list of strategies that should be included along with mathematics instruction. Professional development for mathematics teachers does not usually focus on how to incorporate explicit instruction on self-regulated learning strategies into mathematics instruction. Second, the locus of control in the classroom environment can positively or negatively impact students' use of self-regulated learning strategies. Eshel and Kohav (2003) found that teacher control and student control coexist in the classroom, but self-regulation is fostered in classrooms with strong student control, regardless of the level of teacher control.

1.0.3 DEVELOPING STUDENTS' SELF-REGULATED LEARNING SKILLS

In traditional mathematics education the teacher proposes a problem to be solved; shows a method which should be used; and gives exercises to practice solving this type of problem. Thus the student learns and uses an algorithm for a certain type of problem. This method of teaching learning mathematics doesn't promote the

development of mathematical thinking, problem solving skills, and self-regulation learning.

Teachers should be aware that they should use teaching methods and strategies which develop pupils' problem solving and self-regulation learning skills.

Lester t al. during a 12 week intervention in a seventh grade class used a chart with problem solving tips to be used by the teacher and the students. Some of the tips contained in this chart are related with SRL, for example "be sure to check your work along the way" instruct to self-control. In this research no substantial differences were observed between pupils' activities before and after instruction because of the intervention's short time and the alternative use of problem-solving instruction with regular mathematics teaching.

Gandhi &Varma have showed that the strategic content learning (SCL) approach promotes self-regulated learning in mathematics of class eight. Students taking part in the experiment gain in task performance, perception of task specific self-efficacy, and meta-cognitive awareness about mathematical tasks and strategies.

1.1.0 RATIONALE OF THE STUDY

Self-regulation is viewed as the fourth 'R' of education as critical to student success as a firm foundation in reading, writing and arithmetic (The fourth R, 2014). This analysis of literature is important because no recent reviews of studies on self-regulated learning are available. This review reveals the growing importance of self-regulated learning researches and focuses on the factors that affect self-regulated learning and on the students' learning outcomes from application of self-regulated learning.

There is emerging evidence that self-regulated learning protocols demonstrate strong psychometric properties for motorist tasks such as serving a volley ball, dart throwing, or shooting a basketball free-throw. Across such tasks, self-regulated learning protocols have been shown to differentiate high and low achievers and predict future achievement (Cleary & Zimmerman, 2001; Cleary, Zimmerman, & Keating, 2006; Kitsantas & Zimmerman, 2002). 11 Since many self-regulated learning measures consist of single items, reliability is most often calculated in terms of inter-rater reliability. Several studies have shown that self-regulated learning

measures display acceptable reliability (Cleary, Callan, & Zimmerman, 2012; Cleary & Zimmerman, 2001; Cleary et al., 2006; Kitsantas& Zimmerman, 2002).

SRL and mathematics problem-solving skills are very much linked; however, very few studies have examined SRL during mathematics problem-solving. This study will attempt to examine what mathematics educators have been encouraging from researchers by examining the types of strategies that students employ during mathematics tasks as well as how students select, apply, and adapt specific strategies and SRL processes to meet task demands (Fuchs & Fuchs, 2003; Pape, Bel, &Yetkin, 2003; Resnick, 1988). From the author's perspective, and that of other researchers, to more validly measure this dynamic process,12researchers need to use event-related measures, such as self-regulated learning, that are more sensitive to the specific characteristics and features of specific academic tasks or activities (DeCorte, Verschaffel, &Eynde, 2000; Winne& Perry, 2000; Zimmerman, 2008).

There are a number of teaching methods that would aid students in becoming accountable for their work. Recent research promotes multiple- strategy instruction where students are taught how to use and coordinate multiple strategies (Gersten, Fuchs, Williams, & Baker, 2001; Neufeld, 2005). Lombaerts, Engels, and van Braak (2009) narrowed these multiple strategies into six key components desired in teaching that would promote pupils' self-regulation.

The first component is to motivate the pupils to actively participate in the teaching-learning processes (Boekaerts, 1997). Some ways in which a teacher can incorporate lessons that encourage students to be active participants include, but are not limited to, reciprocal teaching, cooperative learning, hands-on strategies, and paying attention to learning styles.

The second component desired in teaching to promote self-regulation is being able to engage pupils in complex, open-ended activities and offer choices and opportunities to challenge the students (Perry & Drummond, 2002, Perry &VandeKamp, 2000). The choices offered should include what they are doing, whom they are doing it with, where the learning is taking place, and when it is done. By creating room for these choices in the lessons, students may sense an ownership in the learning process. These choices will also allow the teacher to evaluate how each student learns best. The learning environment will be non-threatening because of the open-ended activities offered.

The third component in teaching effective self-regulation would be providing support for self-regulated learning by teaching the strategies and skills that are necessary for independent work (Butler, 2002; Ley & Young, 2001: Perry et. al., 2004; Perry &VandeKamp, 2000). Teachers can incorporate this support through the lessons and through peer collaboration. Self-regulated learning environments encourage choices, constructive criticism, guidance in the learning activities, and ownership of the learning. The strategies must be taught well so students can use these skills in other areas of study. During instruction time in lessons, students will have questions and need clarity. A self-regulated classroom environment is open and collaborative. Therefore, students may need additional help and guidance. Adaptive help seeking is an effective strategy for students who are coping with challenge and students in cooperative learning environments are more likely to ask for help than those in competitive or comparative environments (Newman, 2003). As students work through their learning goals and tasks, the skills that have been incorporated can guide their learning.

The fourth component is providing pupils with opportunities for self-monitoring (Butler, 2002; Butler &Winne, 1995; Zimmerman, 1997), by helping them use and interpret feedback correctly to assess the set goals and by emphasizing short-term, realistic, and specific goals that can easily monitor any progress or improvement (Butler & Winne, 1995; Ley & Young, 2001; Montalvo & Torres, 2004).

The fifth component of teaching effective self-regulation is using evaluation practices that are not threatening to encourage pupils to focus on personal progress and learn from the mistakes made (Ley & Young, 2001; Perry & Drummond, 2002; Perry &VandeKamp, 2000). Monitoring may lead to self-evaluation (Ley & Young, 2001). A teacher can guide students through tasks, give constructive feedback and provide ideas of how to solve the problem. These steps can be helpful to students as they try to become self-regulated learners (Pintrich, 1995). The evaluation done in a classroom should lead students to become more self-regulated. Self-regulation "requires the development of both self-monitoring and self-evaluation processes." (McCombs, 1989).

The sixth and final component is to emphasize self-reflection and provide support for newly acquired instruction (Paris & Paris, 2001). Patrick and Middleton (2002) found that educators must actively address students' views of knowledge and learning. They recognized that educators cannot assume that students can

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automatically integrate and revise new and existing information. Therefore, the instruction needs to continually be revised, renewed, and reinforced.

Although researchers have suggested that event-based assessment tools may be more adequate for measuring SRL as a contextualized process, minimal research directly compares the utility of different SRL assessment approaches. Given that self-report questionnaires continue to be the most widely used form of SRL measurement, and that there is emerging evidence for the utility of SRL event measures, it is of particular interest to determine how SRL questionnaires, teacher ratings, and event measures relate to one another and if self-regulated learning predicts unique variation in academic tasks. The current dissertation addresses this research need by examining the validity of self-regulated learning relative to more traditional questionnaire assessment tools.

1.2.0 OBJECTIVES OF THE STUDY

The objectives of the study are:

- To study the self-regulated learning in mathematics of class IX students of Balasore district.
- To study the attitude towards mathematics of class IX students of Balasore district.
- To study the treatment, gender and their interaction on self-regulated learning in mathematics of Balasore district.

1.3.0 HYPOTHESES

- There is no significant difference between the self-regulated learning method of teaching in mathematics and the traditional method of teaching in mathematics of class IX students of Balasore district.
- There is no significant relationship between attitudes towards mathematics of class IX student of Balasore district.
- There is no significant difference between the treatment of boys and girls and their interaction of self-regulated learning in mathematics of Balasore district.

1.4.0 DELIMITATIONS OF THE STUDY

Prior to beginning the study, several limitations were considered. The foundation of this study was the explicit instruction of self-regulated learning strategies in middle grades mathematics classes. The study will be conducted under the following constraints:

1. The student will be selected randomly from the selected schools of Balasore district.
2. The contents will be restricted to class of IX mathematics syllabus prescribed by government of Odisha.
3. Only 45 days treatment will be provided.
4. The sample will be limited students of Balasore district.
5. Medium of instruction will be Odia.
6. The lesson plan will be developed in Odia.

1.5.0 OUTLINE OF THE REST OF REPORT

Following this introduction to the study, there is a literature review based on studies and articles by experts in the field of self-regulation. Overviews of the methods and procedures that were used in the study are included along with an explanation of the data collection process, statistical analyses and outcomes. Then there is a report of the study findings followed by a discussion of their implications, limitations, ethical considerations, and recommendations.