ORIGINAL RESEARCH PAPER

Education

KEY WORDS: Metacognition, Multimedia, Integral Calculus, etc

METACOGNITION AND MULTIMEDIA BASED TEACHING ON ACHIEVEMENT IN MATHEMATICS OF STANDARD XI STUDENTS

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ABSTRACT

This study was conducted to find the relationship between metacognition and post test scores of control group and experimental group students of standard XI. The investigator developed a multimedia based content with specially designed mathematical software called Geogebra for the unit Integral Calculus. The investigator also constructed a metacognition scale to measure the metacognition of the students. The control group was taught through traditional method of teaching, whereas the experimental group was subjected to multimedia based teaching. Result shows that there exist significant relationship between the metacognition and post test scores of experimental group and the control group students. It is also noted that the metacognition scores of control group students are greater than the experimental group students.

INTRODUCTION

Cognition and Metacognition plays prominent role in individual needs and interest. It brings the innate potential of the individual learners. It is believed that both Cognitive and Metacognitive strategies lead to creative thinking, divergent thinking and to learn their subjects with more speed. Metacognition makes the students to lead his own way of learning, increases speed and self-efficacy. Now-a-days educationalist to trigger the students' to use this cognition and metacognition to achieve in their studies. Teacher should encourage the questions of the students which stimulate their reflective thinking and motivate them to attain the learning goals. Reflective diaries, portfolio and sharing among peers help the students to improve the metacognition skills.

NEED AND SIGNIFICANCE OF THE STUDY

Educationists suggest that the curriculum should be framed according to the development of cognition and metacognition of the students. The quantity and quality of children's metacognition knowledge and monitoring skills through systematic training may be feasible as well as desirable (Flavell,1979). Empirical research has shown that metacognition has the potential to increase the meaningfulness of students learning in different domains (Hartman, 2001). Technology can greatly aid the process of mathematical exploration, and clever use of such aids can help in engaging students (NCERT, 2006). Therefore the Investigator wanted to develop a multimedia based content on Integral Calculus and test its effect on the achievement of Mathematics of Standard XI students studying under the State Board Curriculum.

MEANING AND DEFINITION

Metacognition was first coined by John Flavell from Stanford University. According to (Flavell,1976) metacognition is "One's knowledge concerning one's own cognitive processes and products or anything related to them and refers, among other things to the active monitoring and consequent regulation and orchestration of these processes, usually the service of some concrete goal or objective."

Metacognition is referred to be second order cognition. Metacognition means "cognition about cognition" or "thinking about thinking" (Flavell, Miller & Miller, 2002).This Metacognition leads the individual how to learn and to adopt appropriate strategy to complete a task.

REVIEW OF RELATED LITERATURE

Saravanakumar, AR. (2016) examined the effect of metacognitive orientation and attention activation on student achievement in Science. The main objective of the study was to implement metacognitive orientation and find its effect in learning Science. This is an experimental research. Forty seven higher secondary school students were taken for the study. Metacognition inventory and attention activation inventory was used for assessment. The finding of the study was that implementation of metacognitive orientation strategies improved students achievement.

Linda Bol et.al. (2016) studied the effectiveness of Metacognitive Self-Regulated Learning among college students in the Achievement of Mathematics. The main objective of the study was to investigate the effectiveness of Self-Regulated Learning and Mathematics Achievement. The sample was one hundred and sixteen college students in Mathematics course. Students selected from sixteen classes were used for both control group and experimental group. Zimmerman's Self-Regulated Learning was adopted for experimental group for a period of three weeks. At the end of the treatment, a test was conducted to measure the Achievement of Mathematics and Metacognitive Self –Regulation. Significant difference was noted between control group and experimental group by the adoption of Self-Regulated Learning in Mathematics achievement and Metacognition.

OBJECTIVE OF THE STUDY

To find the significant relationship between metacognition and post test scores of control group and experimental group.

HYPOTHESIS OF THE STUDY

There is no significant relationship between metacognition and post test scores of control group and experimental group.

METHODOLOGY

The investigator used Experimental method to find out the effectiveness of multimedia based teaching among standard XI students. The sample consist of 60 students 30 under control group and 30 under experimental group. The investigator used simple random sampling technique to select the sample. A metacognition tool was constructed by the investigator to find the relationship between metacognition and post test scores of control group and experimental group.

RESEARCH INSTRUMENTS

1. Achievement Test in Mathematics on the Unit of 'Integral Calculus' constructed and validated by the investigator and guide (2017).
2. A Multimedia based content on standard XI Mathematics for the unit 'Integral Calculus', was constructed and validated by the investigator and guide (2017).
3. A Scale on Metacognition was constructed and validated by the investigator and guide (2017).

FINDING OF THE STUDY

There is significant relationship between metacognition and post test scores of control group and experimental group.

RESULT AND DISCUSSIONS

There is no significant relationship between metacognition and post test scores of control group and experimental group.

Metacognition Vs Post test scores	N	df	Calculated 'r' Value	Remarks at level 5%
Control Group	30	29	0.52	S
Experimental Group	30	29	0.47	S

(For df 29 the table value of 'r' is 0.35, S –Significant)

From the table, it is inferred that the calculated 'r' value (0.52) is greater than the table value (0.35) for degree of freedom 29 at 0.05 level of significance. Therefore the null hypothesis is rejected. Hence it is concluded that there is significant relationship between metacognition and post test scores on achievement in Mathematics of control group students.

From the table it is inferred that the calculated 'r' value (0.47) is greater than the table value (0.35) for degree of freedom 29 at 0.05 level of significance. Therefore the null hypothesis is rejected. Hence it is concluded that there is significant relationship between metacognition and post test scores on achievement in Mathematics of experimental group students.

CONCLUSION

Result shows that there exists significant relationship between the post test scores of control group and experimental group. By comparing the metacognition scores of control group and experimental group, it is observed that the control group scores are greater than the experimental group. This shows that though the control group students have more metacognition level than the experimental group, it is evident that due to multimedia based teaching the experimental group has scored high in the post test when compared to control group. Hence, it is concluded that the improvement of the experimental group students in the achievement scores is only due to the effect of multimedia based teaching.

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