

The Effectiveness of using controlled Imagination strategy in teaching solid geometry on developing mathematical concepts , reflective thinking skills and attitude towards mathematics of general secondary stage students

Prepared by
Dr. Fayez Mohamed Mansour
Lecturer of curriculum and *mathematics instruction*
Faculty of Education – Fayoum University.

The study aimed at identifying the effectiveness of using controlled imagination in teaching solid geometry on developing mathematical concepts , reflective thinking and attitude towards mathematics of third year genral secondary stage students. In order to achieve the aims of the study , the researcher reformulated the solid geometry unit in light of the steps of teaching using controlled Imagination strategy the researcher also prepared the tools of the study represented in (mathematical concepts achievement test , a test for measuring reflective thinking , preparing a scale for measuring students attitude towards mathematics) .After controlling the tools of the study and selecting the sample of the study , the researcher did the experimental part and got the following results :

1-The experimental group students exceeded the control group students in each of the following: mathematical concepts test, reflective thinking skills test, theattitude towards mathematics scale. This was confirmed with the statistics significance of the differences between means which werein favor of the experimental group students.

2- The study confirmed the effectiveness of the controlled imagination strategy in teaching solid geometry of students as the impact was more than 0.14 in each of the three tools of the study.

In light of the results of the study the researcher recommends the following:

- 1- Conducting training courses for mathematics teachers to train them on using controlled imagination strategy.
- 2- Drawing the attention of mathematics curricula planners in different educational stages especially in the secondary stage to reorganize the academic units in the light of the controlled imagination strategy specially the geometry curricula to introduce mathematics as

activities and exercises that build mathematics models, pictures and frames which introduce mathematical content appropriate to the students.

- 3- Designing a group of different activities in light of this approach and presenting it to the student which aims at increasing achievement of mathematical concepts and developing their reflective thinking skills.
- 4- Introducing a reference framework about controlled imagination strategy and the steps and procedures that are followed by the teacher and his students in carrying out this strategy through the teacher guide prepared by the ministry of education in Egypt.

In light of the results of the study the researcher recommends the following:

- 1- Conducting similar studies of using this method in other branches of mathematics.
- 2- Conducting similar studies of using this method in other educational stages.
- 3- Conducting similar study for identifying the effectiveness of this method with talented students, slow learners or hyperactive and students with attention deficit disorder.
- 4- Conducting similar studies that mix this strategy with other strategies and show its effect on developing other styles of thinking (creative, critical,.....etc) .
- 5- Conducting a similar study to figure out how for mathematics teachers are convinced with using this strategy in teaching mathematics.

Key words: effectiveness - controlled imagination – mathematical concepts – reflective thinking skills – attitude towards mathematics .