The effect of using fractal geometry principles and activities in developing prep stage students' systematic thinking and decision making skills

Prepared by

Dr. Fayez Mohamed Mansour Mohamed

Assistant professor of mathematics curriculum and instruction

Faculty of Education – Fayoum University

The study aims at finding out the effect of using fractal geometry principles and activities in developing first year prep stage students' systematic thinking and decision making skills in Fayoum Governorate. The sample was made up of 76 students sub-divided into two groups; 38 students in the experimental group and 38 in the control one. The researcher re-designed the (geometry and measurement) unit included in the 2016/2017 student book of the second term in light of the fractal geometry activities principles and characteristics. The researcher prepared the following tools: Systematic thinking skills test and mathematics decision making skills measure. The researcher ensured the validity and reliability of the study tools and the equality of the two groups of the study then implemented the experiment. The study revealed the following:

- **The experimental group members outdid the control one in both tools as there were statistically significant differences in the post implementation in favor of the experimental group.**
- **There was a strong positive correlation between the sample members' systematic thinking and decision making skills.**

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

1. **Including the fractal geometry enrichment activities in mathematics courses.**
2. **Preparing training courses for in-service teachers including the fractal geometry principles and activities to enhance their teaching performance during the workshops and training programs.**
3. **Including an introductory unit about fractal geometry in both cycles of basic education mathematics courses.**
4. **Preparing a number of programs and workshops to train both cycles of basic education students on thinking skills in general and systematic thinking specifically.**
5. **Training students on decision making skills by training them on the various thinking forms.**

In light of the study results, the researcher suggests the following further researches:

1. **Studying the effect of using fractal geometry based unit on developing various stages students' creative thinking skills.**
2. **Studying the effect of using fractal geometry based training program on developing prep stage teachers' higher thinking skills.**
3. **Studying the effectiveness of using fractal geometry on developing various stages students' mathematical skills.**
4. **Studying the effectiveness of using fractal geometry on developing various stages students' visual thinking skills.**

Guiding words: fractal geometry – systematic thinking – decision making - skills.