The Effect of Using a Proposed Module in Robotic Mathematics Based on STEM for The Development of Mathematical Proficiency and Future Thinking of Secondary School Students

Abstract :

The current research aimed at exploring the effect of a proposed unit in robotic mathematics based on STEM for the development of mathematical proficiency and future thinking of secondary school students. The researcher prepared a unit of "Robot Mathematics" according to STEM and a teacher booklet for teaching it. The researcher also prepared a test of mathematical proficiency and a questionnaire of future thinking. The sample of the research consisted of (16) students in the first-year secondary school in The Fayoum governorate as an experimental group, and then the pre administration of the research tools were applied. The results of the current research revealed the development of the experimental group students in the pre-test in the mathematical proficiency as a whole and its sub-components as well as the development of future thinking as a whole and its sub-skills. The researcher attributed the results to the fact that the proposed unit in the robotic mathematics based on the entrance of STEM and its teaching methods has helped to develop the components of mathematical proficiency and future thinking. The study also found a positive correlation, significant at (0.01) between the grades of the experimental group students in the pre-test of mathematical proficiency and the future thinking questionnaire. The research recommended teaching the proposed unit based on STEM for first-year secondary students as well as using a range of teaching methods that help the learner to use the components of mathematical proficiency and future thinking.

Keywords *:* Proposed Unit, Robot Mathematics, STEM, Mathematical Proficiency, Future Thinking