

Introducing Functional Thinking in STEM: Early Education Approaches in Elementary Schools

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Abstract:

This study aimed to explore the impact of STEM activities on elementary school students' learning in science and mathematics, as well as their attitudes toward abstract concepts. Conducted as a qualitative study, data was gathered from various sources, including pre- and post-questionnaires and a working document that assessed pupils' understanding through designing, making, and simulations. Nineteen pupils from a fourth-grade classroom (aged 9–10) participated in the study.

The analysis revealed that engaging in STEM activities significantly enhanced students' involvement in classroom activities. These activities not only fostered a deeper understanding of STEM concepts but also made learning more enjoyable and accessible. The hands-on approach of designing and making allowed students to connect theoretical knowledge with practical applications, thereby solidifying their grasp of complex ideas.

Moreover, the study found that the use of technology tools played a crucial role in facilitating learning. Pupils reported that these tools made it easier to understand and engage with mathematical and scientific concepts. For instance, simulations and interactive models helped demystify abstract ideas, making them more tangible and relatable. This positive experience with technology also contributed to increased motivation and enthusiasm for STEM subjects.

The findings suggest that integrating functional thinking into early education through STEM activities can have a profound impact on students' academic performance and attitudes. By providing opportunities for creative problem-solving and critical thinking, these activities prepare students for future challenges in STEM fields. Additionally, the study highlights the importance of incorporating technology in the classroom to enhance learning outcomes and foster a positive attitude toward STEM education.

Keywords:

STEM activities, STEM integration, variables and functions, motivation, pendulum motion.