

Planning and Implementation of Multidisciplinary Research in the Mathematical Education

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Abstract: The current engineering challenges such as energy problem and water resource have called for more collaborations among different subjects than ever before. The development of science and technology has witnessed the challenges and opportunities for multidisciplinary research. Such kind of driving force has been built on the new knowledge landscape by the practice of scientists and engineers who provide the redefinition of the challenging problems and their boundaries of professional consideration. Among all these subjects, mathematics, which has a close relationship with quantity, structure, space, and change is definitely the core and hub of engineering and multidisciplinary practice. Therefore it is very important for the educators to enhance the students' desire of mathematical knowledge learning. Especially the instructors in the high schools, universities and colleges should let the students understand that the mathematics learning is so helpful to their future career because mathematical methods and techniques are typically used in engineering and industrial fields. The students should develop their capabilities and skills of problem solving, reasoning and proof, communication, representation, connections, adaptive reasoning, strategic competence, conceptual understanding, procedural fluency, and productive disposition. This will really be achieved by the planning and implementation of multidisciplinary research, because the technology should be integrated into mathematics classrooms so that the students can become familiar with various mathematical tools. This paper will present the significance, the methodologies and potential research topics of multidisciplinary research in the classroom of mathematics education. This can be regarded as the reference for the mathematics educators.

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