

HONG KONG MATHEMATICS TEACHERS' PERCEPTIONS OF STEM INTEGRATION: AN EXPLORATORY STUDY

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THEME:

Teacher education and professional learning in STEM

BACKGROUND AND AIMS

The theoretical rationale of STEM education has originated from the curriculum integration theories. Numerous studies have discussed the integration of STEM education in covering the interconnected nature of the four disciplines and real-life problems. Three approaches have been widely mentioned, which included multidisciplinary, interdisciplinary and transdisciplinary (Vasquez et al., 2013). Although teachers play a core role in designing and implementing STEM pedagogy at schools, little research explored mathematics teachers' views of STEM. Hence, this exploratory study aims to explore mathematics teachers' perceptions of STEM education to address the issue. Specifically, the study sought to describe the concerns and challenges faced by Hong Kong mathematics teachers in implementing STEM education, and to expand our understanding of implementing STEM education in mathematics teaching.

METHODOLOGY OR PROCESS(ES) UNDERTAKEN

By purposive sampling, nine Hong Kong mathematics teachers (4 primary, 5 secondary) were invited into online interviews. Interviewees were selected based on the criteria that they had taught mathematics in schools and had participated in STEM education. Their teaching experience ranged from 5 to 15 years. They were asked to report their views on the goals and values of STEM education, the approaches of STEM integration, challenges they faced, and its relationship to mathematics.

RESULTS AND CONCLUSIONS

It is found that two values of STEM education are recognized by Hong Kong mathematics teachers, which include promoting students' personal development and social technological innovation. Three integration approaches of STEM pedagogy (multidisciplinary, interdisciplinary and transdisciplinary) are identified. The transdisciplinary approach is most preferred, but the interdisciplinary approach is most adopted. Teachers perceive both internal and external challenges when implementing STEM at schools. The external challenges are related to administrative resources or support. The internal challenges are related to teachers' professional knowledge and students' learning styles. Teachers' views of the relations between mathematics and STEM education are diverse, although most of them agree that students could develop and apply mathematical knowledge in STEM activities.

REFERENCES

Vasquez, J., Sneider, C., & Comer, M. (2013). *STEM Lesson Essentials, Grades 3-8: Integrating Science, technology, Engineering, and Mathematics*. Portsmouth, NH: Heinemann.

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