

EMPOWERMENT OF JUNIOR SECONDARY TEACHERS FOR 21ST CENTURY STEM EDUCATION

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STEM Education is the abridged version of four disciplines Science, Technology, Engineering and Mathematics. The acronym was coined at an interagency meeting on science education held at the US National Science Foundation in the 1980s and came into common parlance thereafter. This system is now considered as one of the most successful approaches in integrating science, technology, engineering and mathematics into education. Sri Lanka requires a dynamic, motivated and well-educated workforce endowed with STEM skills. When examining the literature, it is revealed that it is important that teachers be equipped in this regard as well as their professional development in order to achieve certain objectives of STEM education. The major barrier to implement the STEM education is the lack of qualified STEM teachers. In Sri Lanka the teacher plays a major role in the education system. Therefore, before introducing STEM education to the Sri Lankan education system, competencies of teachers on STEM related teaching, ought to be assessed for future interventions. The purpose of the research is to empower junior secondary teachers for the 21st century STEM education. The objectives are to review the presently available teacher competencies for STEM education, to identify the available teacher competencies in the Sri Lankan education system in-service teachers, to study the teacher professional development models for STEM teacher professional development and to prepare a suitable teacher professional development model for the Sri Lankan context. To achieve the objectives, sequential exploratory mixed methods research design will be used. Teacher competencies for STEM education in successful STEM countries such as Finland, Australia, America, China, and South Korea were identified through the literature review. Based on the identified competencies, relevant competencies for the Sri Lankan context were identified as a research finding. Thirdly a survey will be conducted with a purposively selected sample of 60 junior secondary science teachers in the Ampara district, who will be selected using the cluster sampling method, to identify their STEM related competencies which too will be a product of the research. Fourthly, based on the results of the survey, a draft teacher professional development model for STEM education will be introduced to five secondary junior science teachers based on the phenomenological case study research method. Based on the four-step research process, a new teacher development model on 21st century STEM education for Sri Lanka will be developed as the final product of the research.

Keywords: STEM education, Teacher competencies, Teacher development model