

ENHANCING STUDENTS' 21ST CENTURY SKILLS THROUGH MODULAR STEM ACTIVITIES: A NEW CURRICULUM REFORM IN SRI LANKA

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Science, Technology, Engineering, and Mathematics (STEM) education is crucial for developing 21st century skills. The present science curriculum activities in secondary schools often do not prioritize exploration, creativity, and innovation, which are central to STEM activities. The objectives of this study were to assess students' attitudes towards learning science concepts through STEM activities and to explore the challenges they faced while conducting STEM activities given in the proposed science module. It was expected to identify how proposed STEM activities enhance students' 21st century skills. A purposive sample of 121 Grade 6 students from four schools was selected, and a pilot study was carried out in the Western and Sabaragamuwa provinces of Sri Lanka. The STEM activities were selected from the module 'Things Around Us,' focusing on the theme of matter and energy. Data were gathered using a quantitative questionnaire, analysis of formative assessment marks based on rubrics, focus group discussions with students, teacher interviews, and observation schedules. The analysis of the questionnaire data and assessment marks indicated that the proposed STEM activities effectively developed 21st century skills. Teacher interviews supported these findings. Observations and student interviews revealed that students desired more activities focused on designing structures. The observations showed that students found innovative solutions to problems while engaging in STEM activities. In conclusion, the STEM approach provided a more active learning environment while enhancing students' 21st century skills.

Keywords: 21st century skills, Modular approach, Science Education, STEM activities