Developing students' 21st century skills in STEM mentor-mentee outreach programs

ABSTRACT

STEM education has increasingly drawn attention internationally in recent years. In Malaysia, efforts to encourage students to take up STEM subjects have risen, but student enrolments in almost every STEM subject area have continued to fall over the last decade. The situation is even more challenging in Sabah, an East Malaysian state where 72 percent of its schools are located in rural areas with basic utilities and limited infrastructures. Therefore, a STEM Mentor- Mentee outreach program through university-school partnership was developed to address the gap in STEM education attainment. The program targeted tenth graders (aged 16 years) from rural secondary schools to help them learn STEM by relating it explicitly to their local environment. STEM activities were guided by the engineering design process while harnessing their 21st century skills. Mentors consisting of in-seervice and pre-service teachers who provided guidance, support and assistance to mentees. Data were captured through mentees' responses to open-ended questions, mentors' field notes, focus group observation and interviews. A total of 732 students, 342 in-service and 99 pre-service teachers were involved in the programs from 2015 to 2019. Findings suggest that the program was able to develop creativity, problem solving, critical thinking and teamwork skills among rural secondary school students.