Developing Innovative Learning Model in Robotics Education for Students in Primary and Junior high Schools

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Abstract:

Learning with robots plays increasingly vital rules of education in the future. According to constructivist theory of Duffy and Cunningham, robotics education can provide students having practical experience and then can create knowledge, understand technology and generate innovative skill. Several innovative learning processes are developed for engineering education, however it might not appropriate for younger students. This research was aimed to develop the 7-steps of innovative learning model with robotics kits: (1) Motivation and inspiration of creating robots (2) Creative idea development (3) Design thinking (4) Prototyping development (5) Validation and trouble shooting (6) Deployment application and (7) Self-Esteem with robotics competition. Each learning step leads to developing of learning contents, activities, support tools and environments to enhance innovation skills of 7-14 year-old students in the genius engineer project (iDektep) in Kasetsart university. A Focus Group Discussion (FGD) with senior engineers from industries, teachers from primary schools and the iDektep project were evaluated the content and they then constructed validity of the model. The FGD and teachers' and students' perspectives on the learning model were then found as following, firstly the content and construct validity of the model were valid. Secondly, this model was the worthy guideline for the teachers to design of learning contents, activities, support tools and environments related to the students' age and knowledge levels. Thirdly, the robotics kits applied in the learning model encourage the students to learning by doing that can make themselves understanding and knowledge which were stimulated by teachers.

Keywords:

Innovative Learning Model, Innovation Competences, Robotics Education, Constructivist Theor.