Maker-Education: Interdisciplinary Computer Science Activities

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Abstract

Typical characteristics of Making are creative and novel solutions and open, problem-based learning environments. Thereby, Making facilitates interdisciplinary connections and cross-cutting competences, for example, technical understanding, creativity, craft skills, or concepts of sustainability and entrepreneurship. Traditional crafts can be combined with modern technologies such as programmable embroidery machines, 3D printers, laser cutters, or microcomputers. In this way, Making can be an inspiration to further develop a mutual understanding of teaching in tandem with the promotion of creative project activities, simultaneously combining analog and digital tools across disciplines. However, Making is still in its early stages in schools and education. Therefore, much is still undefined and open.

Keywords

Maker-Education, Making, Open Learning Spaces, Interdisciplinary, Teacher Training, STEAM

1. Making, Makerspaces & Maker-Education

In recent years, the Maker movement has surged in popularity and has become attractive for didactic research [1]. With the introduction of the Swiss Curriculum 21 (https://lehrplan.ch/) in German-speaking Switzerland in 2014, a strong focus on general competencies and future skills such as creativity can be observed in schools. In connection with Making, familiar characteristics from the constructionism theory, such as "learning-by-doing", "objects-to-think-with" or principles such as student-centered, project-oriented, individualised, and self-organised learning are emphasised. Making has many dimensions, and especially in informatics, it can cover topics such as programming, robotics, virtual reality, or data literacy (e.g., building measuring instruments). It also allows for interdisciplinary projects, e.g., explaining biological phenomena or creating musical instruments.

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