Emergent leadership in student-led collaborative activity in a school-based makerspace

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Abstract: The aim of this dissertation study is to analyze how leadership emerges in a school-based makerspace, and analyze the ways in which emergent leadership mediates student-led making activities. The study also aims to investigate how teachers can support productive leadership during student-led collaboration. In the study, leadership is defined as a reciprocal social process that develops in students' interactions. I argue that school-based makerspaces provide an important platform for the development of students' emergent leadership.

Goals of the Research

As a response to the ongoing changes in society and their learning requirements, there is an increased interest in education in the development and uptake of digitally enhanced, collaborative learning environments based on student-interest and initiation (Griffin, Care & McGaw, 2012; Kumpulainen, Kajamaa, & Rajala, 2018). These new environments change the traditional roles of teachers and students, engendering different possibilities for social activity than more traditional school settings. These changes are evidenced in students being able to take more leadership over their learning activities (Martin, 2015). However, the understanding of students' emergent leadership remains poor (Li et al., 2007; Sun et al., 2017; Yamaquchi, 2001). It is hence important to increase research knowledge on students' leadership in contemporary learning environments. Recent research on student leadership primarily focuses on traditional classroom settings in which the problem to be solved and the group composition are defined from the outset. The proposed study aims to contribute to the understanding of students' emergent leadership in a school-based makerspace in which students have a substantial say in how they choose to engage in group activities, and thus take leadership over their learning activity.

In my doctoral study, I aim to depict emergent leadership from three angles: (a) student-student interactions, (b) student-teacher interactions, and (c) students' tool mediated interactions. The research questions are as follows: (a) What types of leadership moves can be detected in students' collaborative work? How do the identified leadership moves mediate collaborative design and making activities? (b) How do the teachers orient towards students' leadership in their reflections on the uptake of a school-based makerspace? How do the interactions between students and teachers enhance students' emergent leadership in the FUSE Studio learning environment? (c) In what ways do the tools and materials used in the FUSE Studio, create a context for diverse students' opportunities to emerge as leaders of joint learning activities?

Background of the Project

Previous research has shown that leadership is a pivotal, yet inadequately understood component of collaborative learning (Li et al., 2007; Sun et al., 2017, Yamaguchi, 2001). Emergent leaders can mediate interaction between group members, which in turn, shapes students' collaborative learning experiences (Li et al., 2007; Sun et al., 2017). Moreover, little is known about how leadership emerges in contemporary, digitally enhanced, open learning environments. The overall theoretical framing of my study draw on sociocultural and post-humanistic approaches, enriched by research on collaborative learning embedded in the learning sciences tradition (e.g. Barron, 2003; Li et al., 2007; Sun et al., 2017). According to this theoretical framing, I define emergent leadership as a social process that develops in students' interaction (Li et al., 2007; Sun et al., 2017; Yamaguchi, 2001).

Methodology

The data comprise of video-recordings (142h), and semi-structured teacher interviews (22). The data were collected in a Finnish city-run comprehensive school, which had introduced a new school-based makerspace called the FUSE Studio (Stevens et al., 2016), in the fall 2016. The FUSE Studio is a student-centered, digitally enhanced design and making environment, which provides students with open-ended STEAM (*Science, Technology, Engineering, Arts, & Mathematics*) challenges.

I will use the techniques of interaction analysis (Jordan & Henderson, 1995) and multimodal interaction analysis (Norris, 2004) in the analysis of the video recordings, and qualitative content analysis (Kvale & Brinkmann, 2009) in the analysis of the interviews. The analytic approach is inductive (Derry et al., 2010) and involves repeated iterations between theory and data. I will use a multi-dimensional approach in the analysis of the data; I aim to depict the emergence of leadership from three different angles to address the research questions of each sub-study. These include: (a) Analysis of the verbal and nonverbal interactions of the students (b) Analysis

of the reflections of the teachers, and the verbal and nonverbal interactions between teachers and students (c) Analysis of students' tool-mediated interactions

Preliminary Findings

The results of the first sub-study of my dissertation showed that students emerged as leaders of the collaborative activities through the use various content-related and relational leadership moves, some of them unique to the makerspace environment. The study also showed that the use of leadership moves contributed to students' roles in collaborative work and these roles seemed to affect the outcome of the students' collaboration. The findings call for promotion of relation building and flexible shifts in role taking during student-led collaborative work

Expected Contribution

The study will produce important information for educational practice by unpacking how students' leadership emerges in a school-based makerspace, how leadership shapes student-led collaboration, and how teachers can support students' leadership as an important component of their transversal 21st century skills. The information and findings will also be significant for the developers of school-based makerspaces in Finnish schools.

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