

Using Web 2.0 Technologies to Facilitate Scaffolding of Student-Led, Collaborative Learning Outside of the Classroom

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Abstract: Collaborative Learning (CL) is a well-established pedagogy for formal learning in the classroom, but there is little research into CL in non-formal learning environments. ‘Scaffolding’ required to structure CL activities, is often absent in non-formal CL. ‘Shadow Modules’, student-led, student-focused CL groups which parallel the taught module/course, provide this scaffolding. Shadow Modules correlate with positive grade outcomes and resources produced by CL activity are shared using Web 2.0 technologies, and utilized widely. Shadow Modules provide a sustainable format for CL outside of the formal classroom.

Keywords: Collaborative Learning, Scaffolding, Web 2.0, non-formal learning, social media

Introduction

Collaborative learning (CL) is a powerful pedagogy (Dillenbourg, 1999), but it requires ‘scaffolding’ (activities or tasks defined by the teacher or facilitator, to structure the collaborative interactions; Wood, Bruner, & Ross, 1976) to be effective. CL also has potential to support CL in non-formal learning (self-directed learning, reinforcing information, revision, or assignments). However, non-formal CL often lacks scaffolding, resulting in loss of direction and focus (Scott, Moxham, & Rutherford, 2014). A framework for scaffolding for non-formal CL activities is needed, therefore. We have developed and approach, ‘Shadow Modules’- voluntary student-led, student-focused CL communities, which run alongside a formal taught module/course, reinforcing the content,

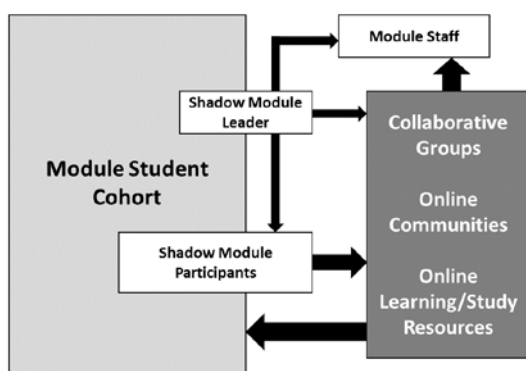


Figure 1. The Shadow Module format, showing interactions between stakeholders.

but are not part of the formal taught curriculum (Scott et al., 2014). The Shadow Module (Figure 1) is run by a ‘Shadow Module Leader (SML) who organizes and leads CL sessions. The SML liaises with the teacher(s) for guidance, but other than this, the Shadow Module has no formal link with the formal taught course. Shadow Modules are either face-to-face CL groups, online collaborative social media communities, or a fusion of both. Resources created in Shadow Module activities are shared with all students *via* Web 2.0 collaborative technologies. Feedback from the SML to academic staff can have positive impact on the ongoing development of the taught module itself. This study evaluates the impact of Shadow Modules on student outcomes and investigates potential factors influencing students’ engagement with the Shadow Module CL activities.

Methodology

Shadow Modules were associated with Year 1, 2 and 3 undergraduate Bioscience modules/courses. Accessions of student-generated Shadow Module resources were counted, to reveal student engagement patterns. The relationship between Shadow Module engagement and module grades was also investigated. Open-question questionnaires, and semi-structured interviews with participants were analyzed using Grounded Theory.

Results

Shadow module resources are used actively by students

Figure 2 shows number of accessions of resources, in the time period prior to, and after, the end of module exam. Usage levels suggest both participant and non-participant students were utilizing shadow module resources. The most effective Web 2.0 medium for authoring resources was the shared document in Google Drive. Social media was the most common platform for sharing resources and outputs (Facebook or Learnium).

Shadow Modules correlate with improved student outcomes

High levels of engagement in the Shadow Module correlated with a significantly greater module grade than students who did not engage in any shadow module activity (Figure 3; unpaired t-test, $P = 0.05$).

Complex factors influence student engagement with Shadow Modules

Figure 4 summarizes the codes from the interview analyses. The codes show that students faced a range of influencing factors, with positive and negative interactions affecting their engagement with Shadow Module activities.

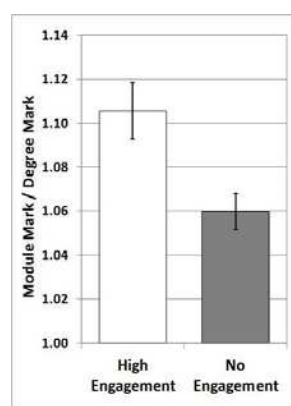


Figure 3. Module grade versus engagement with CL activities. Module grade normalized against overall degree average. High engagers, $n = 17$; non-engagers, $n = 278$. Error bars = SEM. Unpaired t-test shows significance, $P = 0.05$

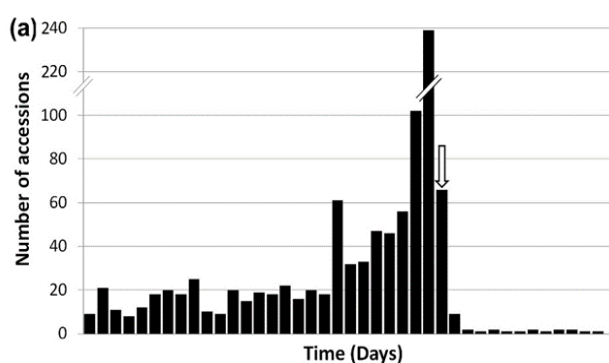


Figure 2. Number of accessions of online resources/day. Date of module examination is indicated by an arrow.

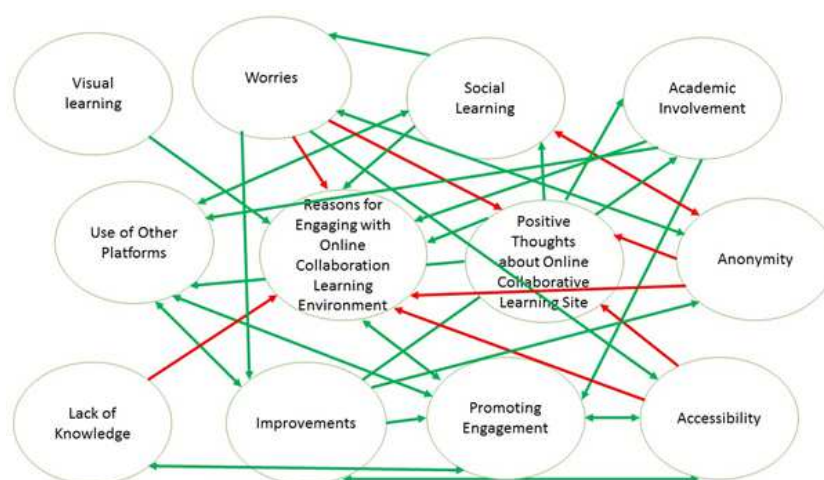


Figure 4. Associations made between themes identified in codes developed from interviews. Arrows represent positive (green arrow), or negative (red arrow) effects on one another.

Discussion

Web 2.0 collaborative technologies appear to facilitate a positive impact of the shadow modules to broaden the scope of non-formal CL activities. Either by developing mutually-supportive online communities, or sharing the outputs of face-to-face CL activities with the wider cohort. Shadow Modules conform to frameworks for scaffolding (Applebee, 1986). By encouraging students to work in partnership – both with each other and with academic staff – they become active agents in co-constructing their own learning and that of their peers.

References

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