RESEARCH BRIEF SERIES

Streamlining the Designs of Seamless Science Learning for Wider Diffusion

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KEY IMPLICATIONS

- Seamless learning based on the "division of labour" model is a feasible and a good compromising technological model for 1:1 in seamless learning, given the current conditions in typical Ministry of Education (MOE) primary schools.

- Use of social media in any formal primary school lesson may provide a vehicle for educators to shape children's perceptions and habits in social networking.

- Interventionist projects or MOE initiatives may develop rubrics for adopting teachers to self-evaluate their lesson designs or enactment.

BACKGROUND

The goal of this project is to translate the primary school seamless science inquiry learning (SSIL) model, originally with the requirement of 1:1 (one-device-per-student) and 24x7 setting, to a "division of labour" (DoL) model that is suitable for typical MOE schools. Seamless learning refers to a continuous learning process across contexts – formal and informal, individual and collaborative, and physical and digital settings.

FOCUS OF STUDY

A streamlined set of five design principles, C²FIP (Connectivity of learning spaces, socio-Constructivist inquiry learning; Formative assessments with student artefacts; leveraging resources in Informal settings; Personalised learning) were derived, adhering to the DoL model, i.e., combining social media and multiple devices (school or home computers, schools' or family members' devices, etc.) – students may switch between these devices to access to a common social media space for cross-contextual learning. Three schools experimented on the new model in two academic years. A rubric was developed during the project to address the participating teachers' emergent need of self-evaluating the seamless-ness of the lesson plans they designed.

KEY FINDINGS

The teachers' DoL lesson plans were well-designed according to the rubric scoring, managed to increase students' engagement level, and resulted in significant learning gains in the second year of implementations. However, infrequent piloting of seamless lessons during the project has rendered challenges for both teachers and students to develop the competencies to optimise the effects of seamless learning.

The teachers facilitated social media-mediated learning trajectories to solicit students' data collected out-of-school and then put their findings to the social space for peer review and knowledge co-construction. The students

made good use of the social media features to support learning and the teachers took the opportunity to educate them on how to participate in social networks responsibly.

The rubric helped the teachers to better comprehend the essence of seamless learning. In addition, several teachers have shared that their involvement in this project have impacted their teaching styles which might potentially spill over to their regular teaching.

SIGNIFICANCE OF FINDINGS

The translated SSIL model based on DoL is proven feasible and is not necessarily inferior to the previous 1:1-supported model. Thus, the model is ready for further diffusion. We advocate future adopting schools to pilot or implement SSIL more intensively, armed with the good practice and lessons learnt from this project, so that the effectiveness of SSIL could prevail.

The study has also proven that primary school students are able to use social media for meaningful learning. Indeed, there are potential opportunities to employ social media in general primary school lessons. That provides a vehicle for educators to shape younger students' perceptions and habits in social networking early. Thus, they will less likely be influenced by irresponsible behaviours when exposed themselves to "natural" social networks in the future.

Interventionist projects or MOE initiatives with the aims of promoting innovative pedagogical frameworks may develop rubrics for adopting teachers' self-evaluation, if the goals are to build the teachers' capacities in designing or enacting lessons adhering to the pedagogical frameworks.

PARTICIPANTS

A total of 411 students and 10 teachers from 3 schools were involved in the study.

RESEARCH DESIGN

We evaluated students' learning gains in content knowledge with pre- and post-tests of each SSIL topic. We investigated students' practice of SSIL through student interviews and analysis of student artefacts posted online and peer discussions, and classroom recordings. We also studied teachers' growth and SSIL teaching practices through scoring the teachers' lesson plans, and analysing teacher interviews and classroom recordings.

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