Collaborative mLearning: A Module for Learning Secondary School Science

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ABSTRACT

Collaborative learning has been shown to be effective for the construction of knowledge. In science instruction, collaboration and knowledge-construction needs to be done in the language of science. A collaborative mLearning (CmL) science module employed uses three computer-mediated communication (CMC) tools: wiki, discussion forum and text messaging. This study seeks to determine the forms of communication and learning in the use of these CMC tools in the CmL module. Twenty (20) Form 2 students of different science abilities participated in the study. Data were collected from student interviews; online communications on the wiki, discussion forums, and text messages; students and researchers’ journal records; and a survey of students’ perception of communication with the CMC tools and learning. The findings showed the learners’ frequency of communication was highest in the wiki and text messaging. The combination of three CMC tools was effective as it catered to learners’ preferred learning styles. Group work and the collaborative activities enabled learning. The CmL module was effective for learning as verified by the improvement in post-test results. The findings of this study provide insights into group interactions in a CmL environment and show that peer interactions scaffold learners in building their knowledge in science.

Keywords

Collaborative mobile learning, Computer-mediated communication tools, Mobile learning, Informal learning

Introduction

Collaborative learning enables learning experiences to be interpreted for the construction of knowledge (Palloff & Pratt, 1999). However, the effect of computer-mediated communication (CMC) tools for collaborative learning, or collaborative mobile learning (CmL), is less explored. Studies have shown that CmL is useful for peer support in scaffolding learning (Boticki, Looi, & Wong, 2011; Timmis, 2012), generating ideas (So, Tan, & Tay, 2012), and knowledge-creation (Rogers, Connelly, Hazlewood, & Tedesco, 2010). Different CMC tools have different affordances: discussion forums (Guzdial & Turms, 2000; Slotta & Linn, 2000), wikis (Bonk, Lee, Kim, & Lin, 2009; Pifarré & Li, 2012; Zhang, Scardamalia, Lamon, Messina, & Reeve, 2007) and text messaging (Capuano, Gaeta, Miranda, & Pappacena, 2005; Timmis, 2012) have been used for learning.

CMC tools have been used for teaching science (Guzdial & Turms, 2000; Slotta & Linn, 2000). However, text messaging, and mobile devices which have been for used for learning language (Arrigo, Gentile, Taibi, Chiappone, & Tegolo, 2005; Boticki, Looi, & Wong, 2011; Capuano et al., 2005; Gerosa, Filippo, Pimentel, Fuks, & Lucena, 2010), are not used much in science instruction. A combination of two tools: text messaging with a wiki (Arrigo et al., 2004), and text messaging with a discussion forum (Gerosa, Filippo, Pimentel, Fuks, & Lucena, 2010; Rau, Gao, & Wu, 2008), has been shown to be effective for science learning. This study will investigate the combination of three tools in developing the CmL Science module.

Collaborative learning is rarely implemented in the Malaysian scenario. Teachers perceive that there is insufficient time to complete the science syllabus and allot little time for social interaction in the science classroom. Teachers emphasize the memorization of facts rather than the scientific processes (Chong, 2005). Hence this study seeks to extend previous research by investigating the use of three CMC tools for learning in the CmL environment: the wiki, discussion forum and text messaging. In addition, it will determine if CMC tools are effective for collaborative and mobile learning in science, and whether these interactions can take place out of the formal classroom environment.

Collaborative learning is the acquisition of knowledge, skills and attitudes as a result of group interactions (Johnson & Johnson, 2004). When CMC tools are employed for interactions, learning becomes mobile and hence, collaborative mobile learning (CmL) occurs; CmL allows group interactions outside the formal classroom.