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Online Communication: The Implementation of the Collaborative mLearning Science Module in a Malaysian Secondary School

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Abstract: Communication skills are required for collaborative discussions among scientists in constructing science knowledge. A collaborative mLearning (CmL) module with online communication tools (discussion forum, wiki, and text messaging) can enable authentic discussions for learning of science outside the classroom. This study seeks to determine whether online communication and collaboration is effective for learning. A developmental research approach with three phases of needs analysis, design, and implementation was employed. An urban school with a multicultural composition was selected for this study. In the Needs Analysis phase, a survey of 158 learners' background in the use of technology was conducted to determine the types of tools which can be used in the CmL module. The module was implemented with twenty (20) selected Form 2 students to determine the types of interactions in their online discussions. Transcripts of their online communications were analyzed according to the types of interactions and processes; the learners were interviewed to verify if learning was effective in the CmL module. The findings showed that learners interacted with the content, instructor, and other learners in the discussion forum. However, only learner-content interaction was detected in the wiki, and learner-instructor in the text messaging SMS Quiz. Findings from interviews verified that learning was effective in the CmL module. In addition, the discussion forum allowed for argumentation to challenge the dualism of science knowledge. This study is significant as it shows that online communication tools foster collaboration and are effective for teaching science.


Keywords: Communication in science; online communication; collaborative learning; mobile learning

1. Introduction

Scientists need to have good communication skills. Communication is important for making meaning out of scientific discussions arising from experimental findings. Communication skills are required in order to debate and defend scientific arguments (Nielsen 2012). Communication and collaboration are skills required in the real world of science. This is because scientific discovery does not occur in isolation, but with interactions among scientists, within a community of peers (Sharma & Anderson 2009). In reality, scientific processes occur when there is collaborative communication among scientists (Hogan & Fisherkeller 2005). As scientists defend their work from their research perspective and try to convince their peers, they require specialized communication skills (Sharma & Anderson 2009).

In order to write convincing reports to argue their viewpoints, scientists need to have good writing skills. Written communications forms an important resource for reference among other scientists (Kubi 2005). However, it is noted that written scientific documents in the original form are not popular for reading even among scientists (Goodby and Long 2003). Hence, science learners should have both reading and writing skills for effective communication in order to contribute to building knowledge in the scientific community (Dodick, Argamon and Chase 2009).

Communication in science should be emphasized in order to teach the nature of science. Teachers seem to have a dualistic perception of the nature of science knowledge (Emdin 2010). In Malaysia, teachers seem to encourage students to memorize the facts of science as they perceive there is insufficient time for science instruction in the classroom (Lee 1991; Sopiah 2000; Tan 2002). There is also little time for communication and collaboration in the classroom, and social interactions are conducted at a lower cognitive level. This situation seems to be similar among urban schools in America (Emdin 2010).

Very few studies have been done on communications in science instruction, and even less on using online communications. However, online communications can be employed to address this problem of limited time for collaboration and communication, and to enable science learners to experience the nature of science in their communications as they contribute to the body of knowledge. Science learning is optimized and thinking skills are enhanced while motivation increases with online communication tools (Driscoll 2007; Gurahal and Tums 2000; Kaye 1992; Tenussen,