GAMIFYING OUTDOOR SOCIAL INQUIRY LEARNING WITH CONTEXT-AWARE TECHNOLOGY

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ABSTRACT

Gamification is a strategy of using game mechanics and experience design to digitally engage people to achieve intended goals in non-game contexts. There has been increasing discussion among educators and researchers about harnessing the idea of gamification to enhance current learning and teaching practices in school education. This paper presents our initiative to gamify outdoor social inquiry learning with context-aware technology, as well as briefly reporting its pedagogic effectiveness measured in a quasi-experimental study.

KEYWORDS

Gamification, Social Inquiry Learning, Outdoor Learning, Context-aware Technology

1. BACKGROUND

Social inquiry learning (SIL), which has been considerably adopted in social humanities education, emphasises on students' inquiry into humans and their relationships with the "societal globe" from multiple perspectives, values and interests (Chadwick, 2008; Hill, 1994; Jansen, 2011). Thus, in the course of SIL, situating and engaging students to interact with real-life, real-world contexts is important (Stripling, 2003, 2008). Curiosity is the best driving force for learning; keeping learners curious via engaging them in game-based activities is a desirable approach to education (Papert, 1993; Piaget, 1970). Gamification refers to the use of game elements in non-gaming contexts (Deterding, Dixon, Khaled & Nacke, 2011). Lee and Hammer (2013) have further defined gamification as the incorporation of game mechanics into non-gaming software applications to promote user experience and engagement.

2. OUR INITIATIVE

Guided by Stripling's (2003, 2008) social inquiry model and Lee *et al*.'s (2013) gamification model, we have developed a GPS-supported gamified learning mobile application (App) (see Figure 1) for engaging and supporting students to pursue context-aware SIL in outdoor environments. Based the received GPS signals, gamified context-aware scaffolds of the App will pop up in accordance with students' physical positions in the real world. The scaffolds will engage and support students in accomplishing the outdoor inquiry tasks at the fieldtrip site. At each inquiry spot, the *Connection* scaffold (see Figure 2), which is in the form of voice navigation, will provide students with background information about the societal issue to be inquired. The *Investigation* scaffold, which is in the form of data-collection exercise, will guide students to gather new information to answer the questions related to the issue. The *Construction* scaffold will assist students in generalising the information on hand via mind-mapping and making an interim conclusion about the issue via audio-recording. The *Reflection* scaffold will support students, via video-blogging, in reflecting on their weaknesses and setting new goals for inquiring the next spot. After completing the tasks at a spot, students will be awarded a "star." The *leader board* (see Figure 3) in the App will dynamically indicate how many stars each student has obtained and how much time he/ she has spent on obtaining the stars in a real-time manner.

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Figure 1. Interface of the App

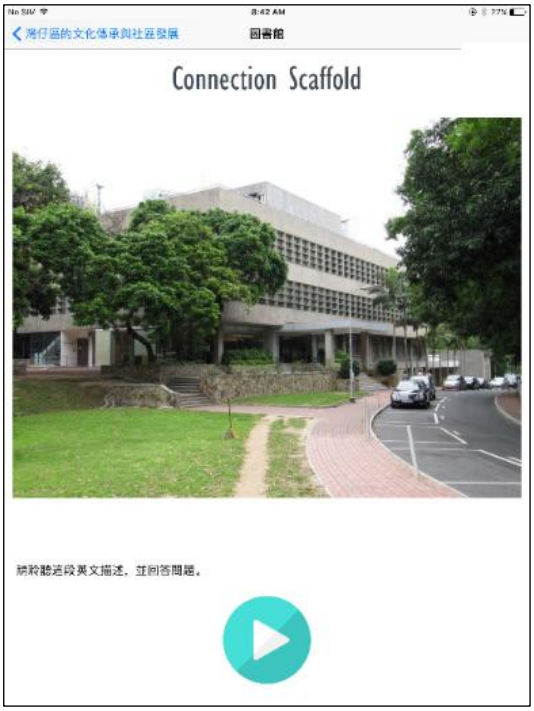

Figure 2. Connection Scaffold

Figure 3. Leader Board

3. RESEARCH FINDINGS

A quasi-experimental study was carried out to investigate the pedagogic effectiveness of the proposed "gamified" SIL (viz. GSIL) approach in comparison with conventional SIL approach, in terms of students' knowledge acquisition. It involved a total of 373 Grade-10 students from top, middle, and bottom academic-banding schools; 128 were high-achieving students, 127 were moderate-achieving students, and 118 were low-achieving students. Results indicated that, compared to the conventional approach, GSIL had different degrees of significant positive effects on the high, moderate, and low academic-achieving students (Cohen's d effect sizes: 0.30, 0.62, and 1.04).

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