Abstract

This proposal presents a plan for studying knowledge gain as a result of flow (the psychological state that human beings achieve when enjoyment is stimulated while learning takes place as described by the American psychologist Csikszentmihalyi's (1996) (Beylefeld 933)) for iterative testing of the prototype for an e-learning game, *Pathogens Against the Body*. The target market for the game is undergraduates majoring in the biological sciences; the sample population for this study is undergraduate biological sciences majors at New Jersey Institute of Technology (NJIT). The independent variables under study comprise the factors relevant to flow as described by the instrument *EGameFlow*: concentration, goal clarity, feedback, challenge, autonomy, immersion, social interaction, and knowledge improvement. This instrument will be administered to students after the game play phase of the study has completed. The dependent variable is the difference in scores on the knowledge test before and after game play indicating knowledge gain and hence success in the game. The study is in three parts: 'Before Game Play', 'During Game Play' and 'After Game Play'. Students will be assigned to one of three groups depending upon their familiarity with games similar to the prototype in the 'Before Game Play' phase. They will also play the game to learn it at this time. In the 'During Game Play' phase, they will play the game collaborating in teams of four. Information related to the meta-cognitive strategies of self-recording, modeling, and thinking aloud will be collected during this phase and the affective learning factors of interest and motivation will be assessed. During the 'After Game Play' phase, round robin discussions on student's experiences playing the game will be held. Statistics will be calculated for student knowledge test scores, *EGameFlow* scores, and their correlations using SPSS software. In addition, qualitative analysis will be performed on the verbal and hand written information collected. Information gleaned from analysis of information gathered during the study will inform modifications to the prototype. It is anticipated that the prototype will undergo several iterations of this study (or a variation of it), refining the prototype with each iteration. Scholars are split concerning the effectiveness of e-learning games as an educational tool; research similar to that in this study will support the effort to develop high quality educational games.