

## ABSTRACT

Although various game design models and development methodologies have been proposed by a number of researchers and are made available in different genre of games, the literatures reveal that (i) the development methodology to produce mobile game-based learning (mGBL) structurally is highly scarce, (ii) most of mobile game methodologies exclude the instructional design (ID) models for developing game-based learning (GBL) and (iii) some design restrictions and aspects that should be considered when developing game on mobile platform are not clearly specified in the existing methodologies and models. Thus, by adopting design research paradigm, this study proposes a mGBL development methodology that incorporates ID models and structured processes. In accomplishing this main aim, specific objectives are also formed: (i) to construct a conceptual model of mGBL development methodology that incorporates structured processes and related ID models, (ii) to verify the proposed development methodology through expert review, (iii) to measure the playability of a game developed based on the mGBL development methodology. In determining whether the proposed mGBL development methodology is workable or not, 5 expert review sessions were conducted which indicated that they believed the methodology to be feasible, usable, useful, effective and efficient for its purpose. This provides an alternative for developers to adopt a methodology when developing a mobile game used for learning purposes. The validation is further supported by an experimental study through a heuristics evaluation study, where 64 respondents played the game and answered an instrument at the end of the play sessions. The mGBL was evaluated with respect to four dimensions: game usability, game mobility, game play, and learning content. All these dimensions made up the playability measure, which was counted to be 4.025 (out of 5) indicating a high value. In general, this study contributes to game design area, where a mGBL development methodology is proposed. It also produces an award winner 1'Msia game prototype for the pleasure of the community.