Playability Guidelines for Educational Video Games: A Comprehensive and Integrated Literature Review

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ABSTRACT

Learning through play is currently an effective and attractive educational strategy. However, are all educational video games (EVG) successful and do they always keep the player motivated? Here, the authors emphasize that the success of an EVG will be more achievable if the game quality is measured, and suggest the use of playability property as a suitable and effective tool to do this. To this end, they present a set of guidelines that are based on Educational Playability (Playability in EVG), which were compiled by analyzing the existing game guidelines to achieve a good EVG design, to form a basis for evaluating the EVG quality, acting as useful tools for developers to enhance videogame playability. The authors propose that through the use of guidelines an acceptable level of playability can be achieved and this ensures the players’ motivation, which is a complicated process requiring the consideration of many aspects (playful, educational, etc.).

Keywords: Educational Video Game (EVG), Guidelines, Playability, Player Experience (PX), Video Game Design

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INTRODUCTION

EVGs have proved to be very popular due to the fact that they teach, build and strengthen certain skills and concepts while being enjoyable. During our research we found many EVGs that appeared on the market before their efficacy had been ensured (González Sánchez et al., 2009; Ibrahim et al., 2011, 2012a), as a result, numerous games have failed, due to the failure of designers to achieve the player objectives in a fun and attractive learning environment, and due to the lack of standards that connect educational and playful contents in an integrated environment (De Freitas, 2006; Kelle et al., 2011). Also, Royle (2008) related the failure of some EVGs to the lack of motivation and educational content “Such efforts have failed either because games designed to educate do not engage their intended audience, or because truly engaging games do not provide enough educational value.” One major issue of current approaches is the lack of design rules to ensure their effectiveness, which have found challenges with using leisure games effectively in learning contexts, particularly in terms of setting and assessing specified learning objectives (De Freitas, 2006).

Videogames normally have different design perspectives (artistic, ludic, social, etc.) than other types of educational software (Hainey et al., 2011). In the case of EVGs, two fundamental pillars which must be included in the game are fun and education. Finding a balance between these two aspects, as well as considering the PX, will make a game more successful and desirable to players. Inserting the educational content, in many cases, leads to loose of the provided fun, which make an EVG inefficient. Law et al. (2008) presented some problems of current EVG as a poor balance between playing and learning activities or between challenge and ability. Also, Prensky (2004) argued that instructional designers often do more harm than good when they work on educational games, and if players of educational games don’t enjoy the experience, they won’t be engaged in the activity, and therefore will not learn much “Whenever you add an instructional designer, they suck the fun out.”

Good levels of playability are very important in this type of video games due to the role that playability has as a tool to characterize, measure PX and to evaluate whether a game is fun and learnable or not (Ibrahim et al., 2011, 2012b). Another factor that ensures the success of an EVG is the quality of game design. Thus, a poorly designed game or a bad choice of game elements (story, challenges, puzzles, etc.) means that the player spends more time ascertaining how to play than in achieving the objectives of the content provided, constituting a barrier to effective learning (“extrinsic load”) (Sweller, 1994) and playing. Therefore, it is necessary to couple the targeted content with the fantasy context and story, which affects on motivation and emotional (Malone & Lepper, 1987), and it is related to cognition and cognitive load (Sweller, 1994; Gunter et al., 2008). For this reason, both analyzing the levels of playability in a game and using game guidelines during the design phase are needed in order to ensure player satisfaction, and to ensure the development of an effective EVG.

To facilitate an effective design it is necessary to apply knowledge and techniques obtained through experience in game design that have been evaluated by users and have reached acceptable levels of quality. In this paper, we propose an integrated and comprehensive set of design guidelines that are based on playability attributes to inform and improve the quality of EVGs, which are drawn from the analysis of an extensive literature survey with the aim of gathering together whatever is suitable and useful for EVG guidelines. These guidelines have been classified in various categories, for each category we will present a brief discussion, and an example to explain its importance and its effects on playability attributes.
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