Digital Game-based Learning

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Game-based learning (GBL) has gained an enormous amount of attention from researchers and practitioners. GBL defines an environment where game content and game play enhance knowledge and skills acquisition, and where game activities include problem solving spaces and challenges that provide learners with a sense of achievement (Qian & Clark, 2016). A number of review studies have researched the effectiveness of game-based learning in various content areas (e.g., Boyle et al., 2014; Connolly et al., 2012; Qian & Clark, 2016). The findings of these reviews indicate GBL can facilitate knowledge acquisition, problem solving skills, critical thinking, creativity, collaboration, and communication.

The intervening variables affecting the success of GBL include academic topic, learner preferences and participant age (Qian & Clark, 2016). Furthermore, the design complexity of the game influences learning and engagement (Young et al., 2012). Educational games with simple designs are narrowly focused on academic content, target low-level literacy, provide drill and practice methods similar to worksheets, and stress memorization of facts, and thus fail to enhance students' motivation and engagement. However, research has revealed that entertainment games are able to promote meaningful learning through providing players with adaptive challenge, inquisitiveness, self-expression, innovation, immediate feedback, clear goals, player control, immersion, collaboration, competition, variable rewards, and low-stakes failure (e.g., Boyle et al., 2014, 2016; Squire, 2011).

Effective game design elements are well aligned with learning theories such as social constructivism (e.g., the sociocultural theory of learning) and can provide situated learning, promote social interactions, increase motivation and engagement, and afford opportunities to develop skills such as collaboration, creativity, com-

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munication, and critical thinking (Qian & Clark, 2016; Young et al., 2012). Game designs which feature a blending of established learning theories with game design elements aligned with entertainment games design features, are most likely to lead to effective learning (Qian & Clark, 2016). With regard to game genres, design-based games tend to work better than simply having students play educational or entertainment games.

Games are categorized into different genres including educational (e.g. serious games, simulations, edutainment), entertainment and mobile games. A wide range of learning outcomes (e.g., creativity, critical thinking, collaboration and communication) and age range (pre-elementary-adult) are examined in research on GBL.

Research and review studies on GBL provide sufficient reason to be optimistic about the potential of using a game-based learning approach to promote the skills needed in twenty-first century learning (e.g., creativity, communication, collaboration, critical thinking).

The Research Questions

1. How is GBL different from traditional instructional methods?
2. What learning skills are typically promoted by GBL?
3. What theoretical approaches are used in designing GBL?
4. What are the different types of games and which type has shown to be more effective for skill development? Why?
5. To what extent are effective game designs conducive to developing learners' critical thinking, collaboration, and communication skills?
6. What variables should be considered for the game design to be successful?
7. What are some differences between serious games and entertainment games?
8. How can teachers scaffold GBL to support students' development?
9. What factors should be considered in choosing appropriate games for learners to foster twenty-first century skill development?
10. What do teachers need to know to become a classroom game designer? How can we help teachers to develop such expertise?

Suggested Resources

Jabbari, N., & Eslami, Z. (2019). Second language learning in the context of massively. multiplayer online games: A scoping review. *ReCALL, 31*(1), 92–113. https://doi.org/10.1017/S0958344018000058.

This scoping review examines the second language acquisition (SLA) literature with regard to the role of "massively multiplayer online games" (MMOGs) in second language (L2) learning. The review mainly focuses on commercially

developed off-the-shelf MMOGs. The study reviews the current empirical research to determine which aspects of L2 learning have been examined, how they were investigated, and what the findings propose in relation to L2 learning opportunities and outcomes within and beyond MMOG contexts. The authors synthesized the findings of 31 empirical studies examining the role of MMOGs in L2 learning. Their findings revealed that the empirical research in this area was mainly qualitative and that motivational and affective factors, L2 vocabulary, and learners' communicative competence were the most widely investigated topics. The authors used the findings to present a model that illustrates hypothetical interrelationships among (a) MMOG designed settings, (b) the social and affective affordances present in these settings, (c) L2 learning opportunities, and (d) L2 learning outcomes achieved. The authors conclude that MMOGs offer socially supportive and emotionally safe (i.e. low-language anxiety) environments that offer multiple opportunities for L2 learning and socialization, facilitating L2 learners' enhancement of their L2 vocabulary repertoire and promotion of their communicative competence in the target language.

Boller, S., & Kapp, K. (2017). *Play to learn: Everything You Need to Know About Designing Effective Learning Games*. **Alexandria, VA: ATD Press**.

This book ventures to connect between instructional design and game design. The book presents relevant terminologies, key concepts and strategies from a designer's point of view. The authors guide the reader by explaining instructional and learning goals, creating player identities, and defining the hurdles of the games. Also, the authors exemplify how to align the learning objectives with the game design, mechanics, theme and story. It provides great examples and step-by step advice on creating effective learning games that capture the learners' attention. They provide detailed explanation on three phases of game testing and provide practitioners with strategies to collect crucial feedback from players. The book is full of useful tools for studying commercial games and for designing your own games. The book includes several worksheets to help teachers plan the goal and rules for an educational game.

Farber, M. (2017). *Gamify Your Classroom: A Field Guide to Game-Based Learning (New Literacies and Digital Epistemologies)*. **New York: Peter Lang Publishing Inc**.

This book provides guidelines on how to apply game-based learning in everyday classrooms. It gives an outline of the current theories of gamification, the history of the movement, future predictions, and some new learning platforms developed by leading tech companies. Moreover, the author provides the readers with a plethora of tips, ideas, knowledge, lesson plans, and resources beneficial for both teachers and teacher educators at the end of each chapter. This book presents a highly accessible model for implementing new instructional frameworks using game-based learning.

Becker, K. (2016). *Choosing and using digital games in the classroom: A practical guide*. **Cham, Switzerland: Springer**.

This book displays an in-depth synopsis of the uses of digital games in education, from K-12 up through post-secondary classroom. It begins with a glance at the history of games in education and the setting for the digital games. It provides an overview about the different methods of serious game implementation, including the Magic Bullet Model, which focuses on the player's perspectives of the game experience. This book also discusses how to measure the effects of game-based learning in education and provides guidelines about how to create digital-game based lesson plans. It is a highly useful resource for teachers and practitioners.

De Freitas, S. (2006). *Learning in Immersive Worlds: A review of Game-based Studies*. **London, UK: JISC e-Learning Program**.

This report was produced to inform practitioners who are considering using games and simulations in their practice. The report includes a review of the literature and a series of case studies to illustrate the wide array of uses of games and synthesizes key issues and themes to be considered when learning in immersive worlds. A useful list of findings from the case studies is included in the executive summary at the beginning of the report. Furthermore, this comprehensive report includes productions from a consultation with experts in the field.

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