Noah Koubenec

koubenecn1@citadel.edu

Annotated Bibliography and Reference URLs

Hainey, T., Connolly, T. M., Boyle, E. A., Wilson, A., & Razak, A. (2016). A systematic literature review of games-based learning empirical evidence in primary education. *Computers & Education 102*, 202–223. doi: 10.1016/j.compedu.2016.09.001

**Topic**

**Use of games in education**

**Summary:** This meta-analysis reviewed hundreds of studies on games in education to identify evidence supporting effectiveness and areas in need of further investigation.

**Method and limitations:** this systematic literature review identified 105 papers for review from an initial pool of 18,000 articles. The authors focused on empirical articles on games-based learning (GBL), with one limitation being its exclusive focus on traditional empirical research (particularly randomized control trials) as the source of suitable evidence on efficacy of games-based learning.

**Context and relevance:** The meta-analysis spans more than a decade and offers a comprehensive review of literature on GBL during a period in which it saw rapid adoption in primary education (2000-2016). Of particular relevance for this project is the consideration of advantages of 3D vs. 2D games.

Ak, O., & Kutlu, B. (2015). Comparing 2D and 3D game-based learning environments in terms of learning gains and student perceptions. *British Journal of Educational Technology 48*(1), 129–144. https://doi.org/10.1111/bjet.12346

**Topic**

**Use of games in education**

**Summary:** This mixed-methods study used a pre- and post-test as well as a questionnaire to assess user perceptions (perceived value) of both 2D and 3D games as well as their effectiveness on learning outcomes.

**Method and limitations:** the researchers used a pre-test and post-test to measure achievement of learning outcomes as well as a Likert-type questionnaire to understand user attitudes toward game environments differing on one element – whether the game environment was 2D or 3D.

**Context and relevance:** This research is somewhat unique for its consideration of the effectiveness and user perceptions of 2D game-based learning environments as opposed to 3D game-based learning environments.

Thompson, M., Uz-Bilgin, C., Tutwiler, M. S., Anteneh, M., Meija, J. C., Wang, A., Tan, P., Eberhardt, R., Roy, D., Perry, J., & Klopfer, E. (2021). Immersion positively effects learning in virtual reality games compared to equally interactive 2d games. *Information and Learning Sciences*, ahead-of-print(ahead-of-print). doi: 10.1108/ils-12-2020-0252

**Topic**

**Use of games in education**

**Summary:** this research used a pre-test/post-test and interview (mixed methods) design to determine the achievement of learning objectives on a module on cell structure when delivered in games with both a non-stereoscopic and stereoscopic view, finding enhanced immersion of the learner when the stereoscopic view was used.

**Method and limitations:** A pre-test and post-test were administered to 51 adult participants to assess the effect of game presentation (stereoscopic “3D” or non-stereoscopic “2D”) on learning outcomes. Participants were interviewed to determine their sense of immersion.

**Context and relevance:** The authors refer to “2D” games as games using non-stereoscopic views regardless of whether the game environments themselves are 2D or 3D, and to 3D games as games using stereoscopic views. This non-conventional terminology is somewhat confusing and stereoscopic or non-stereoscopic is not equivalent to the dimensionality of game environments themselves, the research is still potentially useful given its finding that efforts to improve immersion may have a positive effect on learning outcomes. Further research on achieving immersion in games with 2D environments may be appropriate.

The Effects of Using Digital Game Based Learning in Primary Classes with Inclusive Education. (2021). *European Journal of Contemporary Education 10*(2). https://doi.org/10.13187/ejced.2021.2.450

**Topic**

**Use of games in education**

**Summary:** this research used a pre-test/post-test and interview (mixed methods) design to determine the achievement of learning objectives on a module on cell structure when delivered in games with both a non-stereoscopic and stereoscopic view, finding enhanced immersion of the learner when the stereoscopic view was used.

**Method and limitations:** this quasi-experimental research (n=36) examined the effect of a learning game compared to more traditional educational approaches for students of Latin. Participants were primary school students with special educational needs.

**Context and relevance:** This research is directly relevant to the application of game-based learning to instructional content for diverse learners. Specifically, the research is helpful for its insight on the value of game-based learning as a means to support learning outcomes in learners with various forms of disabilities.

Zhang, R., Cheng, G., & Chen, X. (2020). Game-based self-regulated language learning: Theoretical analysis and bibliometrics. *PLOS ONE 15*(12), e0243827. doi: 10.1371/journal.pone.0243827

**Topic**

**Use of games in education**

**Summary:** the authors examine the integration of self-regulated learning and game-based learning in language learning contexts.

**Method and limitations:** this article provides a theoretical analysis of the interdisciplinary field of game-based self-regulated learning, including key theoretical concepts, history of the field, and likely future developments. Theoretical, social network, and thematic analyses were conducted on self-regulated game-based learning articles.

**Context and relevance:** The researchers’ examination of the intersection of game-based learning and self-regulated learning offers valuable insight for the project, as it incorporates a learning game designed to be completed at the learner’s pace, outside of a classroom environment. The authors note a number of self-regulated strategies which can be employed in game-based contexts, including “behavioural strategies, motivational strategies, cognitive strategies, and self-reflection” (p. 9).

**Technology for Accessibility Links**

Javora, O., Hannemann, T., Volná, K., Děchtěrenko, F., Tetourová, T., Stárková, T., & Brom, C. (2020). Is contextual animation needed in multimedia learning games for children? An eye tracker study. *Journal of Computer Assisted Learning 37*(2), 305–318. <https://doi.org/10.1111/jcal.12489>

Improving accessibility in unity games: <https://www.raywenderlich.com/5783444-improving-accessibility-in-unity-games-part-1>

Color Oracle, resource and system tray application for design (including game design) for various forms of colorblindness: <http://colororacle.org/>

Game Accessibility Guidelines: a community-created resource demonstrating approaches to developing accessible games: <http://gameaccessibilityguidelines.com/>

5 Things we Learned About Developing an iOS Game for blind Players: <https://www.gamasutra.com/blogs/DianaHughes/20131120/205346/>

Unity Accessibility Plugin: <http://www.metalpopgames.com/assetstore/accessibility/doc/index.html>

Jaramillo-Alcázar, A., Venegas, E., Criollo-C, S., & Luján-Mora, S. (2021). An approach to accessible serious games for people with dyslexia. *Sustainability 13*(5), 2507. <https://doi.org/10.3390/su13052507>

Grammenos, D., Savidis, A., & Stephanidis, C. (2009). Designing universally accessible games. *Computers in Entertainment 7*(1), 1–29. <https://doi.org/10.1145/1486508.1486516>

Accessible Gaming Diagram Center Report: <http://diagramcenter.org/diagram-reports/diagram-2020-report/accessible-gaming.html>

Can I Play That? <https://caniplaythat.com/about-can-i-play-that/>

Flores-Garzón, E. P., Intriago-Echeverría, L. J., Jaramillo-Alcázar, A., Criollo-C, S., & Luján-Mora, S. (2020). Catch the Thief: An Approach to an Accessible Video Game with Unity. International Journal on Advanced Science, Engineering and Information Technology, 10(3), 905. https://doi.org/10.18517/ijaseit.10.3.10938

Transcribing Games, a community project for audio descriptions of video games: <http://www.transcribinggames.sightlesskombat.com/>