**Topical Reference List: Gamification in Education**

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I have no known conflict of interest to disclose.

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# Abstract

Inserting educational technology in today's climate of teaching has become a certainty for teachers and students alike. Technology is all around us, and harnessing a student's potential using various educational games, tools, and strategies in an engaging way to develop collaborative and problem-solving skills that can carry a student forward for a lifetime. Researching the cognitive, behavioral, social, and intellectual impacts of gamification could improve with the right design and implementation.

*Keywords*: E-learning, Collaboration, Problem-Solving, Technology, Gamification

**Introduction**

Technology has become a staple in our everyday lives, including education. Whether we use those technologies to search for information, develop our programs, or even play video games, technology is inserted in everything the human race does. At the same time, as a gamer myself, inserting game mechanics into our daily routines has become common in our home and at work. Gamification can be a motivation to accomplish daily tasks, improve learning, and have an effect on human behavior. The existing literature on gamification is limited to addressing education in the classroom and work environments, but what is the overall impact of gamification? If gamification were to be implemented in specific settings of our choice, what would be the impact?

**Common Themes**

As I read through the articles and studies to better understand my research, I noticed themes throughout relating to the behavior changes of the subjects in a gamified environment. The common theme I was seeing was the emphasis on how the roles of players in a game mirror the psychological profiles of the subjects outside of the gaming environment. Gamification or even video games, in general, does carry elements of psychological, emotional, and behavioral modification when it pertains to motivation and engagement of the material. One of the gaps I have seen is the subjects are not identified in the age range of K-12. In this instance, I would at least propose a study of those of High School or even middle school range since the level of play-based learning is more limited than elementary-aged children.

 **Topical Reference List: Gamification In Education**

Alsawaier, R. S. (2018). The effect of gamification on motivation and engagement. The International Journal of Information and Learning Technology, 35(1), 56-79. <http://ezproxy.liberty.edu/login?qurl=https%3A%2F%2Fwww.proquest.com%2Fscholarly-journals%2Feffect-gamification-on-motivation-engagement%2Fdocview%2F1977184867%2Fse-2%3Faccountid%3D12085>

 This qualitative paper identified gaps in research in gamification between study and theory. This study was of university-aged students throughout three classes. The paper emphasizes identifying the different personality and player types while also exploring the effects of gamification on the individual. The results show a lack of literature on the behavior and motivation of learners and whether or not gamification would engage the learner more effectively. Further study is needed in the realm of the influence of behavior within the guidelines of the game and how it is implemented.

Buckley, P., & Doyle, E. (2017). Individualizing gamification: An investigation of the impact of learning styles and personality traits on the efficacy of gamification using a prediction market. Computers and Education, 106, 43-55. <https://doi.org/10.1016/j.compedu.2016.11.009>

This quantitative research explored the gamification behaviors of the participants and perceptions of those behaviors. The initial group sample of 157 Undergraduate students was narrowed to 95. They measured the data using the Spearman-rho product movement correlation coefficient. Results showed a correlation between learning styles, gamified behaviors. This paper calls for more research into these behaviors in the future.

Hamari, J. (2017). Do badges increase user activity? A field experiment on the effects of gamification. Computers in Human Behavior, 71, 469-478. <https://doi.org/10.1016/j.chb.2015.03.036>

 This quantitive study measured an application by promoting a gamified mechanic of achieving badges. The participants were identified as University-aged participants separated into two groups of brand new and legacy users. The users were tracked for one calendar year. Data collection was based on user actions and behaviors, and how many continued to use the application after the trial period. The results show evidence of behavior changes based on user activity.

Kocadere, S. A., & Caglar, S. (2018). Gamification from player type perspective: A case study. Educational Technology & Society, 21(3), 12-22.

This quantitive research paper identified its purpose of filling some of the gaps in research of gamification at that time. This discusses the different player roles in a game and how a gamer's play style directly connects to their personality or psychological profile. Participants were in a gamified learning environment for seven weeks and were completed in four phases. The sample pool was 197 Undergraduate students among seven universities, and results were measured using the Chi-square method. The results identified multiple personality types that affected a person's style of play and determined how it could translate into the real world.

Landers, R. N. (2019). Gamification Misunderstood: How Badly Executed and Rhetorical Gamification Obscures Its Transformative Potential. Journal of Management Inquiry, 28(2), 137–140. <https://doi-org.ezproxy.liberty.edu/10.1177/1056492618790913>

This mixture of qualitative and quantitative research discusses the various gamified mechanics that lead to a lack of understanding of legitimate versus fake gamification. Since gamification has started becoming more popular and mainstream, developers began making counterfeit gamified products to market but fail due to poor design. This literature also addresses where, how to improve, and how to implement gamified practices properly.

McDougall, A. (2018). When I say … gamification. Medical Education, 52(5), 469-470. <https://doi.org/10.1111/medu.13481>

This article is not research-based but does provide supporting commentary on the "why" participants in gaming play games. It is means of escape from the mundane world, wherein in some games, little to no mental effort is exhibited compared to the participants' careers can be considered high stress. It highlights in medicine; for example, gamification can be promoted as the human experience of play to decompress from stressful situations.

Mullins, J. K., & Sabherwal, R. (2020). Gamification: A cognitive-emotional view. Journal of Business Research, 106, 304-314. <https://doi.org/10.1016/j.jbusres.2018.09.023>

This qualitative article describes the effects of gamification and the enhancement of emotional and cognitive responses in students by enhancing services through gameful experiences. Some of the studies explored mental activities that looked into the participants' attention, language, memory, and interactions. The participants were members of HICSS, and the results called for more study into the emotional, mental effects of gamification.

Nacke, L. E., & Deterding, S. (2017). The maturing of gamification research. Computers in Human Behavior, 71, 450-454. <https://doi.org/10.1016/j.chb.2016.11.062>

While this is a literature review with supporting comments, the authors emphasize the fundamental question of whether gamification works. The authors discuss the evolution of the study of gamification and the importance of inclusion. The concept of gamification is promising as more research and development come as technology grows and improves.

Rodriguez, M., Isotani, S., & Zarate, L. (2018, May). Educational Data Mining: A review of the evaluation process in the e-learning. Elsevier: Telematics and Informatics. <https://doi.org/10.1016/j.tele.2018.04.015>

 This article is a quantitive summary of how data is retrieved in a web-based learning environment. This article discusses the chain of events when information is collected and interpreted while also showing the differences between e-learning and face-to-face instruction. The participants are individuals involved in the teaching and learning (TL) experience. The ages of the students have not been identified; it is under the assumption the students are in the K-12 environment.

Sailer, M., & Lisa, H. (2020). The Gamification of Learning: a Meta-analysis. Educational Psychology Review, 32(1), 77-112. <http://dx.doi.org.ezproxy.liberty.edu/10.1007/s10648-019-09498-w>

 This review is a meta-analysis of multiple pieces of literature and identified various themes amongst them. The authors identified common sample pools, quantitive research, and the search results in the popular peer-reviewed search engines. They identified the participants as most adults. However, they assumed some studies where the researchers did have children in K-12 environments. The authors used a mixed analysis to test the various cognitive, behavioral, and social interactions and found significant differences in gamified environments.