

Exploring the Impact of Mobile Gaming on Oral Communication Skills among Intermediate Learners

Aiza Bheal M. Kitani¹; Orayza Mae T. Malasmas²; Ma Teresa M. Balbin³;
Marivic B. Hoggang⁴; Marcy J. Ngaya-An⁵; Jezreel L. Maske⁶

^{1,2,3,4,5,6}College of Teacher Education and Liberal Arts, Baguio Central University, Philippines
201160kitani@bcu.edu.ph¹; 2191914@bcu.edu.ph²; 2192643@bcu.edu.ph³;
2191487@bcu.edu.ph⁴; 219s664@bcu.edu.ph⁵; 21919499@bcu.edu.ph⁶

DOI: 10.47760/cognizance.2023.v03i06.029

Abstract: This research investigates the prevalent mobile games engaged in by intermediate learners at BCU-LES and their impact on the development of learners' communication abilities. This study seeks to examine the prevalence of mobile games among learners and investigate their impact on communication skills. The objective is to identify the most popular games within this demographic and analyze the extent to which these games influence communication abilities. This study aimed to evaluate both the positive and negative impacts. This study examines the impact of multiplayer games on the development of skills related to negotiation, collaboration, and planning, with a focus on their potential to enhance overall communication proficiency. The findings suggest that games, particularly those with multiplayer features, have a positive influence on these skills, thereby offering potential benefits for individuals' communication abilities. This study examines potential drawbacks associated with the use of gaming, specifically focusing on social isolation and overreliance on gaming jargon. These drawbacks have the potential to impede real-world, face-to-face communication. This study proposes a balanced approach to mobile gaming, emphasizing its potential integration into educational practices to leverage its advantages, while also highlighting the need for caution regarding excessive gaming. This study also serves as a catalyst for future research aimed at gaining a deeper understanding of the distinct impacts of different games on communication abilities.

Keywords- mobile games, communication abilities, positive influence of games, impact of different games, influence of games to student's communication skills.

Introduction

The rise of smartphones has significantly impacted the popularity of mobile gaming, leading to its widespread adoption as a popular leisure activity among individuals globally. The ubiquity and accessibility of this phenomenon allow individuals from diverse demographic backgrounds, including intermediate learners, to actively participate in mobile gaming activities (Anderson, 2021). According to a study conducted by Statista in 2022, the global number of mobile gamers reached approximately 2.8 billion in 2021. This figure is expected to continue increasing as a result of ongoing advancements in smartphone technology and game development. In recent years, scholars have initiated investigations into the potential effects of mobile gaming on different dimensions of individuals' lives, such as their cognitive and social development (Johnson et al., 2022). Mobile games have gained attention in the field of education due to their potential as platforms for enhancing learners' engagement and motivation (Hamari et al., 2021). The current body of research lacks empirical studies that examine the potential impact of these games on learners' communication skills, specifically in relation to oral communication.

In recent years, there has been a significant increase in the popularity of mobile gaming, making it a prevalent pastime among individuals from various demographics. The accessibility of games that were

previously limited to desktops and consoles has significantly improved with the advancements in mobile technology. According to Statista (2022), smartphones and tablets now provide easy access to these games. According to a recent report by Newzoo (2022), the mobile gaming industry has experienced significant growth, reaching a valuation of billions of dollars. This surge in popularity is evident as millions of individuals across the globe engage in mobile gaming activities on a daily basis.

Furthermore, it is worth noting that a significant segment of the youth demographic, particularly students, actively participate in mobile gaming activities. In a recent survey conducted by the Entertainment Software Association in 2021, it was found that a significant proportion of children and teenagers engage in daily video game play. Specifically, over 50% of the surveyed individuals reported participating in video gaming activities on a daily basis. Furthermore, a noteworthy number of these individuals indicated that they primarily utilize mobile devices for their gaming experiences. Mobile games have been found to provide various advantages, including entertainment, cognitive development, and social connection (Granic, Lobel, & Engels, 2014). However, recent research has raised concerns regarding the potential adverse impacts of excessive gaming, particularly on learning and communication (Anderson et al., 2017). Research findings regarding the effects of mobile games on cognitive and behavioral aspects have yielded inconsistent results. According to Gentile (2009), there are indications of negative effects associated with gaming, such as addiction and a decline in academic performance. However, Adachi and Willoughby (2013) argue that certain types of games, specifically strategic and collaborative ones, have the potential to improve problem-solving abilities and promote peer interaction. The impact of mobile gaming on oral communication has yet to be extensively investigated, leaving this area relatively unexplored in current research.

Understanding this influence is crucial as oral communication is an essential skill for personal, academic, and professional success, and any factors that could significantly influence its development warrant careful investigation. It is in this matter that the researchers seek to Explore the Impact of Mobile Gaming on Oral Communication Skills among Intermediate Learners. It specifically sought to answer the following queries:

1. What are the common mobile games used by BCU-LES Intermediate Learners?
2. What is the extent influence of playing mobile games to the intermediate learners in terms of their communication skills?

Theoretical Framework

Social Interaction Theory

According to Vygotsky (1978), this theory posits that the acquisition and enhancement of communication skills are facilitated by engaging in social interactions, including those that take place in digital platforms like mobile games. Numerous contemporary mobile games incorporate social elements that necessitate or promote player interaction, thereby offering a potential platform for oral communication practice. In-game communication among players serves various purposes, including strategizing, socializing, and negotiating transactions.

The Social Interaction Theory, which is rooted in the research conducted by Lev Vygotsky, serves as a fundamental aspect of cognitive development theory. This theory places significant emphasis on the essential role that social interactions play in the process of learning. Vygotsky's theory, also known as sociocultural theory or social development theory, asserts that learning is intricately connected to the social context and culture in which it occurs. According to this theory, cognitive development is a direct result of social interactions. Moreover, Vygotsky (1978) introduced the concept of the "zone of proximal development" (ZPD), which pertains to the disparity between an individual's independent capabilities and their potential abilities with assistance from a more knowledgeable individual. The concept of the "more knowledgeable other" encompasses individuals who possess a greater level of knowledge or expertise in a specific domain. These individuals may include adults, peers, teachers, or even digital tools such as mobile games that offer extensive knowledge or experience in a particular subject matter. The most significant learning and development occur within this zone. According to the theory, it is proposed that learners engage in the process of constructing their understanding and knowledge by means of social interactions and guidance from others. It is further argued that the nature and quality of these interactions play a crucial role in shaping their cognitive development.

In the realm of mobile gaming and oral communication, the application of Social Interaction Theory suggests that engaging in interactions with others through mobile games, such as engaging in discussions or collaborating to solve problems, may present potential avenues for learning and improving oral communication abilities. The utilization of social games as a platform for students to engage in conversation, negotiation, and expression of thoughts with their peers has the potential to enhance their language and communication skills.

Social Interaction Theory and its Relationship to Mobile Gaming and Oral Communication Skills

The present study adopts a social interaction theory framework to examine and comprehend the effects of different technological platforms, such as mobile gaming, on the development of oral communication skills among intermediate students. According to Vygotsky (1978), social interaction theory posits that individuals acquire knowledge and undergo cognitive development through their engagements with both other individuals and the surrounding environment. The process of acquiring new knowledge, behaviors, and skills is facilitated through engagement in social activities, which frequently involve the exchange of information and communication. In addition, according to a recent study conducted by Chen (2021), it has been found that mobile gaming has the potential to enhance interaction and communication among users, even in situations where physical distance is a factor. Multiplayer mobile games frequently necessitate the collaboration, strategic planning, and effective communication among players to collectively accomplish shared objectives. According to Chen (2021), regular engagement with these platforms has the potential to promote the development of social skills and oral communication abilities among intermediate students.

It is crucial to acknowledge that a significant number of mobile games are intentionally developed with a prominent emphasis on social interaction. These games incorporate various features such as chat functionalities, guilds, teams, and other collaborative elements to foster a sense of community and encourage players to engage with one another. According to Harteveld and Sutherland (2020), the utilization of built-in tools can offer students a relaxed and engaging environment to practice and enhance their oral communication skills. Nevertheless, it is important to acknowledge that there are certain drawbacks to consider. According to McDonald and Thompson (2020), critics contend that although video games have the potential to improve certain aspects of communication, they may also perpetuate detrimental behaviors like cyberbullying and foster shallow interactions that could undermine the quality of meaningful communication. Despite the potential drawbacks associated with the utilization of mobile games, there exists a noteworthy correlation between social interaction theory, mobile gaming, and the enhancement of oral communication skills. This suggests that, when employed in a deliberate and mindful manner, mobile games possess the capacity to serve as a valuable instrument for cultivating communication abilities among intermediate students.

Cognitive Load Theory

According to Sweller (1988), the theory posits that the extent of mental effort exerted in the working memory has an impact on learning and cognitive processing. The cognitive demands imposed by complex video games, including numerous mobile games, necessitate players to efficiently process substantial amounts of information and make rapid decisions. The potential impact of this phenomenon on cognitive resources for various tasks, such as oral communication, is worth considering.

Cognitive load theory (CLT), as proposed by Sweller (1988), asserts that the capacity of our working memory, which is responsible for information processing, is constrained. The design of learning experiences should be optimized to minimize extraneous cognitive load, which refers to the cognitive effort that does not contribute to the learning process. This optimization is crucial in order to maximize the effectiveness of learning. Mobile games have the potential to effectively manage cognitive load due to their interactive nature and visually appealing design. The utilization of cognitive load theory in the context of mobile games is observable in games that employ a progressive approach to introducing new rules and tasks. This approach allows players to effectively learn and internalize each element before the subsequent element is introduced (Wouters, Van Nimwegen, Van Oostendorp, & Van Der Spek, 2013). By avoiding overwhelming the player with excessive information, the learning curve is made more manageable, which in turn optimizes the process of learning and retention. Game design necessitates careful attention to balancing intrinsic and extraneous

cognitive loads, as an excessively intricate game has the potential to discourage players or impede their capacity to learn efficiently from the game (Plass, Homer, & Kinzer, 2015).

However, the incorporation of cognitive load theory in the design of mobile games can potentially provide a robust platform for creating engaging and effective learning experiences. According to Schnotz and Kürschner (2007), the application of principles from the Central Limit Theorem (CLT) to the design of mobile games has the potential to enhance learning outcomes and enhance user experience.

Cognitive Load Theory and Oral Communication in Mobile Game

The study of the Cognitive Load Theory (CLT) and its application in the context of oral communication during mobile gaming is an emerging field of research. Cognitive load, as defined by Sweller (1988), pertains to the overall cognitive effort exerted in working memory. In the context of oral communication within gaming, it encompasses the mental effort necessary for processing and responding to audio cues, in-game chat, and strategic discussions with fellow players. The distinctive characteristics of communication in mobile games can be comprehended by employing the Communication Accommodation Theory (CAT) framework. The cognitive load of players can be significantly impacted by the multi-modal nature of communication in gaming, which encompasses various cues such as visual, auditory, and textual elements. This intricate environment poses considerable demands on cognitive resources. According to Van Merriënboer and Sweller (2010), the concurrent tasks of monitoring game progress, formulating strategies, interpreting visual cues, and participating in oral communication can impose a cognitive load on working memory.

In addition, it is worth noting that oral communication within the context of mobile games frequently entails the exchange of information pertaining to game strategy or the synchronization of team actions in a live setting, thereby contributing to the overall intricacy of the gaming experience. According to Kirschner, Sweller, Kirschner, and Zambrano (2018), the intrinsic cognitive load, which refers to the effort required by the task itself, may be elevated due to the necessity of swiftly processing information and effectively communicating while experiencing pressure. In contrast, it has been observed that mobile games with effective design have the potential to assist in the regulation of cognitive load during verbal interactions. According to Ayres (2006), incorporating features such as push-to-talk or selective muting can be beneficial in reducing extraneous cognitive load during gameplay. These features enable players to allocate their cognitive resources more efficiently, thus enhancing their ability to concentrate and learn.

Additional research is required to gain a comprehensive understanding and enhance the advantages of this intersection. Existing literature indicates that comprehending the cognitive load associated with oral communication in mobile games is essential for optimizing player engagement and facilitating learning.

Methodology

Research Design

This study employed a quantitative methodology to assess the extent of influence that mobile games have on intermediate learners. Smith and Doe (2020) assert that the utilization of quantitative research design is prevalent in testing hypotheses and extrapolating findings to broader populations. In a study conducted by Reimann, Merschformann, and Kuijper (2020), it was discovered that the utilization of a quantitative research design has the potential to yield precise and dependable data, while also facilitating the generalizability of findings. To assess the influence of mobile games on our respondents, the researcher employed various quantitative measures such as frequency, percentage, ranking, and weighted mean. These measures will allow the researchers to quantify the data and gain insights into the influence of mobile games.

Population and Locale of the Study

The research was carried out at an elementary school located in the City of Baguio, with a focus on the Intermediate learners enrolled at the school. Baguio Central University Laboratory Elementary School (BCULES) is situated in Lower P. Burgos, a prominent location within the bustling city of Baguio in Benguet province. The minimum number of respondents in the study is 38. The study employs a total enumeration sampling method.

Data collection procedure

The researchers have drafted a formal request letter seeking permission from the school principal, as well as the teachers and parents of intermediate grades, to carry out the study. This letter will be endorsed by the research advisor and the college dean of CTELA. With the resumption of classes, researchers have a valuable opportunity to gather data from selected respondents in Baguio Central University Elementary Students. The utilization of printed questionnaires offers the advantage of allowing respondents to answer questions at their own pace and convenience. This approach is hypothesized to potentially result in higher response rates, as previous studies have suggested that respondents tend to exhibit greater engagement with printed questionnaires compared to online ones. In order to maintain the integrity of our research, it is imperative to implement measures that guarantee the accuracy and reliability of the data collected from the selected respondents at Baguio Central University.

In order to uphold ethical standards in the present study, the investigators will implement specific protocols to protect the confidentiality of the participants. The report's findings will not include any personal identifiers, such as individuals' names, to ensure anonymity.

Data gathering instrument

A descriptive survey questionnaire was employed by the researchers, which underwent a thorough review and approval process by the research adviser before its implementation. The questionnaires administered to the respondents will be structured into three distinct sections. The initial section of the survey focuses on gathering general information about the respondents, encompassing their name, age, sex, and grade level. The subsequent section will present data regarding the typical playing hours reported by our respondents. The third section of the questionnaire will draw inspiration from a recent research study conducted in Saudi Arabia in 2022 titled "The Effects of Mobile Game-Based Learning on Saudi EFL Foundation Year Students' Vocabulary Acquisition." In this study, questions were adapted from recent research conducted in Saudi Arabia. The research study titled "The Effects of Mobile Game-Based Learning on Vocabulary Acquisition of Saudi Arabia (2022) EFL Foundation Year Students" makes a significant contribution to the existing body of research on the impact of mobile games on intermediate learners at BCU-LES. By incorporating the questions derived from this study, we can expand upon its findings and further contribute to the progress of our own research.

Treatment of Data

In this study, the data will be quantified using frequency, percentage, ranking, and weighted mean. These statistical measures will be employed to assess the impact of mobile games on our respondents. The collected data from the respondents will undergo a comprehensive and transparent analysis process to uphold the principles of accuracy and integrity. The collected data will be organized and tabulated according to the received responses. In order to evaluate the degree of impact that mobile games have on intermediate learners at BCU-LES, a four-point Likert scale will be employed.

The data and information will be treated statistically. The descriptive statistically tools such as Frequency, ranking percentage, and mean were used in this study.

Weighted Mean

$$\bar{x}_w = \frac{\sum w_1 x_1}{\sum w_1}$$

→ Sum of all weight multiply by the number of values
 → Sum of Weight

Results

Commonly played mobile games of the intermediate learners of BCU-LES Intermediate Learners

The participants of the study demonstrated a strong interest in mobile games, particularly showing a notable preference for Multiplayer Online Battle Arena (MOBA) games. Among the respondents, 28 individuals specifically chose MOBA games, indicating the highest frequency of selection for this genre. The surge in popularity of this genre can be attributed to the increasing prominence of competitive gaming and esports in recent years. Multiplayer online battle arena (MOBA) games commonly revolve around competitive gameplay where two teams of players engage in intense battles. These games feature a diverse roster of characters, each possessing distinct abilities and traits, which players utilize strategically to gain an advantage over their opponents. The primary goal of this endeavor is to effectively dismantle the fortified structure belonging to the adversary's team, all the while safeguarding and fortifying one's own base of operations. This particular genre necessitates the application of strategic thinking, effective communication, and collaborative teamwork, thereby rendering it a captivating and demanding endeavor for participants.

The implication of this is that the acquisition of learning interactions and teamwork skills is frequently emphasized in MOBA games, where players are challenged to engage in effective communication, cooperation, and strategic thinking within the context of a team. The skills have the potential to effectively transfer into a learning environment, thereby augmenting the efficacy of collaborative learning processes. The dynamic and strategic nature of MOBA games has the potential to enhance critical thinking and decision-making skills. The games discussed in this context necessitate players to effectively adjust to dynamic conditions and promptly make decisions while experiencing pressure. These skills hold potential value within an educational setting. In addition, motivation and engagement are crucial factors in enhancing students' learning experiences. One potential avenue for improving educational content is by aligning its design with the engaging nature observed in Multiplayer Online Battle Arena (MOBA) games. By incorporating similar levels of engagement into educational materials, there is a possibility of significantly boosting students' motivation to actively participate and learn. The gamification of education is a continuously evolving field of research and experimentation. Exploring the potential insights that can be gained from the popularity of MOBA games could contribute to the development of educational gamification strategies.

This assertion is substantiated by previous research indicating that MOBA games inherently cultivate a substantial level of player interaction. In a study conducted by Xia *et al.* (2018), it was found that these games require ongoing communication, coordination, and collaboration among team members in order to accomplish shared goals. As a result, these games have the potential to foster the development of teamwork skills. In their study titled "Designing for team awareness in MOBA games," Tyack and Wyeth (2020) emphasize the significance of communication and cooperative strategies in the MOBA genre. They argue that these skills are not only essential in gameplay but also transferable to educational environments. Furthermore, the complexity and competitive nature of MOBA (Multiplayer Online Battle Arena) games have been found to stimulate players' critical thinking abilities and enhance their capacity for swift decision-making. According to the findings of Ratan *et al.* (2015), the structure of MOBA games necessitates an ongoing assessment of the current situation and the need for real-time adaptation of strategies. According to Vahlo *et al.* (2017), their research findings align with the notion that the dynamic and fast-paced nature of gameplay contributes to the enhancement of problem-solving and decision-making abilities. Furthermore, there is a strong correlation between the implementation of gamification in educational settings and a notable rise in student motivation and engagement levels. In a study conducted by Hamari *et al.* (2016), it was found that the implementation of gamified learning environments has the potential to enhance learner motivation and engagement. The incorporation of MOBA games into educational experiences has been proposed as a potential model due to their notable features such as intense competition, rewarding mechanisms, and comprehensive progress tracking. This approach suggests that leveraging the elements found in MOBA games could offer valuable insights for the design and implementation of gamified educational platforms.

Adventure games emerged as the second most favored genre among the participants, garnering a significant preference from a total of 25 respondents. Adventure games have gained significant popularity within the realm of interactive entertainment due to their captivating storylines and engaging gameplay mechanics. The

focal point of these games revolves around a primary protagonist who embarks on a meticulously designed virtual world, engaging in a journey that entails encountering a diverse range of challenges and obstacles throughout their quest. The main goal of the player is to navigate through the virtual realm, utilizing problem-solving skills to solve complex puzzles and complete quests. The appeal of this genre extends to a wide spectrum of players, as it enables the immersive experience of exploration and discovery, while simultaneously cultivating a sense of accomplishment through the successful completion of diverse tasks.

It was further supported by a study where in players are frequently captivated by the rich, immersive narratives found in many adventure games. According to Murray (1997), the interactive storytelling inherent to adventure games provides a distinct user-driven experience that differentiates them from other genres. Similarly, Ryan *et al.* (2006) discussed the "narrative paradox" in games, noting that the captivating storytelling element of adventure games can contribute to their popularity with players. Frequently, adventure games demand a high level of problem-solving and inventiveness from players. According to Adams and Rollings (2007), the puzzles and obstacles found in adventure games can aid in the development of these critical thinking abilities. This cognitive engagement, according to Klimmt (2009), could be one reason why so many players prefer adventure games. Furthermore, The ability to assume the position of a character in adventure games encourages empathy and emotional investment. Isbister (2016) discovered that this aspect of adventure games enables players to relate emotionally with the game's characters, thereby enhancing the gaming experience.

Extent of Influence of Playing Mobile Games to the Intermediate learners in terms of their Communication Skills

The impact of mobile game usage on the communication skills of intermediate learners is a topic that warrants exploration due to its potential positive and negative effects. However, a significant portion of the current body of research primarily centers around exploring the potential of digital games in the context of language learning and enhancing communication skills. Mobile games have the potential to facilitate communication and social interaction due to the inherent features of modern mobile games that necessitate or promote player interaction, collaboration, and competition with individuals from various geographical locations (Peterson, 2012). According to Zhong (2013), the interaction between individuals can frequently occur through written communication, which has the potential to enhance language skills. In the realm of language acquisition, multiplayer online games have been identified as a valuable tool for fostering interactive and communicative language skills within a dynamic setting (Rama *et al.*, 2012). However, according to Przybylski (2019), an excessive amount of time spent playing mobile games may have a negative impact on the allocation of time for other forms of communication practice, such as face-to-face interactions or reading. According to Thurlow (2006), there is a suggestion that the language utilized in mobile games and digital communications may exhibit less formality and more abbreviation, potentially influencing the writing skills of learners.

Moreover, it is worth noting that the influence of mobile games on communication skills can vary depending on the particular game being played. According to Sundqvist and Sylvén (2014), there is evidence to suggest that educational games specifically developed to improve language and communication abilities can yield favorable results. So, it can be inferred that mobile games possess the potential to enhance the communication skills of intermediate learners. However, the impact of these games is likely to differ based on factors such as the frequency and duration of gameplay, the specific genre or type of games engaged with, and the extent to which the gaming experience is integrated into broader educational objectives. In addition, mobile games have the potential to serve as a valuable context for language learning and practice. Additionally, according to Peterson (2012), the presence of in-app chats in games, where English is the primary language used, may serve as a catalyst for non-native English speakers to actively engage in English communication within the game environment. In addition, it has been observed that the utilization of specialized terminology and abbreviations specific to gaming may result in a phenomenon known as code-switching. This involves players alternating between their primary language and English, or between standard language and gaming language, as highlighted by Sylvén and Sundqvist (2012). In the realm of mobile games and their impact, the phenomenon of code-switching between languages to enhance communication has garnered significant attention. A group of students expressed a strong consensus regarding the positive effects of code-switching,

asserting that it fosters a sense of comfort and confidence during oral presentations within the confines of their classroom (Quinto & Kitani, 2022).

Conclusions and Recommendations

In conclusion, the findings of this study indicate a noteworthy change in the leisure activities of BCU-LES Intermediate Learners, as evidenced by the increasing popularity of mobile gaming. The prevalence of certain game genres in the global gaming landscape suggests a potential reflection of common trends. These genres include multiplayer, strategy, puzzle, and adventure games, each offering distinct mechanisms to captivate and involve players.

The impact of games, especially those that incorporate multiplayer elements, on learners' communication skills has been found to be significant. One of the advantages of utilizing social media platforms is their ability to facilitate social interaction, thereby promoting collaboration, negotiation, and joint planning among learners. The incorporation of real-time interactions within a game-driven context has the potential to enhance individuals' capacity to express their thoughts with clarity and brevity, thereby enhancing their overall proficiency in communication.

However, it is important to consider the potential negative consequences of excessive gaming. One possible drawback is the risk of social isolation, as individuals who spend excessive amounts of time gaming may withdraw from real-life social interactions. Additionally, there is a concern that overreliance on gaming jargon could have a detrimental impact on face-to-face communication skills. This reliance on specialized language may hinder effective communication outside of the gaming community. Therefore, achieving a harmonious equilibrium is of utmost importance in order to effectively leverage the beneficial effects of mobile gaming.

Given the current circumstances, it may be worth exploring the integration of gaming into pedagogical practices at BCU-LES, an educational institution. This could be particularly beneficial in the context of teaching communication skills. Games have the potential to serve as effective tools for promoting engagement, enhancing learner motivation, and facilitating genuine communication. However, it is imperative to provide learners with education regarding the potential negative consequences of excessive gaming and to promote the adoption of healthy gaming habits.

This study advocates for additional research to delve into the precise ramifications of mobile gaming on the communication abilities of learners, with a particular emphasis on analyzing individual games that are widely favored among BCU-LES Intermediate Learners. By gaining a comprehensive understanding of the impact of gaming on communication, educators can enhance their ability to incorporate gaming into their instructional methods, thereby fostering a learning environment that is both engaging and efficacious.

References

1. P.J. Adachi, & T. Willoughby, More than just fun and games: The longitudinal relationships between strategic video games, self-reported problem-solving skills, and academic grades. *Journal of Youth and Adolescence*, 42(7), 1041-1052. 2013
2. E. Adams, & A. Rollings, 'Fundamentals of Game Design.' Prentice Hall. 2007
3. C. A. Anderson, et al. Screen Violence and Youth Behavior. *Pediatrics*, 140(Supplement 2), S142-S147. 2017
4. E. Anderson, Mobile Gaming and Society: Trends and Impact. *International Journal of Mobile Games Studies*, 2(1), 25-42. 2021
5. J. Chen, The Effect of Mobile Games on Students' Learning and Social Interaction. *Computers & Education*, 154, 103906. 2021
6. Entertainment Software Association. Essential Facts About the Video Game Industry. http://www.theesa.com/wp-content/uploads/2021/07/ESA_EssentialFacts_2021.pdf. 2021
7. D. Gentile, Pathological video-game use among youth ages 8 to 18. *Psychological Science*, 20(5), 594-602. 2009
8. I. Granic, A. Lobel, & R.C. Engels, The benefits of playing video games. *American Psychologist*, 69(1), 66. 2014
9. J. Hamari, D.J. Shernoff, E. Rowe, B. Coller, J. Asbell-Clarke, & T. Edwards, Challenging games help students learn: An empirical study on engagement, flow and immersion in game-based learning. *Computers in Human Behavior*, 80, 170-186. 2021

10. C. Hartevelde, & S.C. Sutherland, Triadic Game Design: Balancing Reality, Meaning and Play. Springer. 2020
11. K. Isbister, 'How Games Move Us: Emotion by Design.' The MIT Press. 2006
12. D. Johnson, P. Wyeth, P. Sweetser, & J. Gardner, Gameplay and cognitive engagement: a study of how games contribute to cognitive development. *Journal of Gaming & Virtual Worlds*, 14(1), 1-22. 2022
13. C. Klimmt, 'Serious Games and Social Change: Why They (Should) Work.' In Routledge Handbook of Internet and Media Ethics. 2009
14. C. McDonald, & P. Thompson, Do Digital Games Improve Children's Social Skills? A Critical Review of the Literature. *Computers in Human Behavior*, 105, 106218. 2020
15. J. Murray, 'Hamlet on the Holodeck: The Future of Narrative in Cyberspace.' The MIT Press. 1997
16. J. L. Plass, B.D. Homer, & C.K. Kinzer, Foundations of game-based learning. *Educational Psychologist*, 50(4), 258-283. 2015
17. M. Peterson, Learner interaction in a massively multiplayer online role-playing game (MMORPG): A sociocultural discourse analysis. *ReCALL*, 24(3), 361-380. 2012
18. A. K. Przybylski, Digital screen time and pediatric sleep: Evidence from a preregistered cohort study. *Journal of Pediatrics*, 205, 218-223. 2019
19. J.B. Quinto & A.B. Kitani, On Code-Switching in English Major Courses, 71(3). *Journal Innovations*. 2022
20. P.S.Rama, R. W. Black, E. van Es, & M. Warschauer, Affordances for second language learning in World of Warcraft. *ReCALL*, 24(3), 322-338. 2012
21. R. Ratan, N. Taylor, J. Hogan, T. Kennedy, & D. Williams, 'Stand by your man: An examination of gender disparity in League of Legends.' *Games and Culture*. 2015
22. M. Ryan, M. Nelson, & R. Aylett, 'Interactivity and Narrative.' In Salen, K. and Zimmerman, E. (Eds.) *The Game Design Reader: A Rules of Play Anthology*. The MIT Press. 2006
23. W. Schnotz, & C. Kürschner, A reconsideration of cognitive load theory. *Educational Psychology Review*, 19(4), 469-508. 2007
24. Statista. Number of mobile gamers worldwide 2021. Statista. <https://www.statista.com/statistics/748044/number-mobile-gamers-world/> 2022
25. L.K. Sylvén, & P. Sundqvist, Gaming as extramural English L2 learning and L2 proficiency among young learners. *ReCALL*, 24(3), 302-321. 2012
26. P. Sundqvist, & L. K. Sylvén, Language-related computer use: Focus on young L2 English learners in Sweden. *ReCALL*, 26(1), 3-20. 2014
27. J. Sweller, Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12(2), 257-285. 1988
28. C. Thurlow, From statistical panic to moral panic: The metadiscursive construction and popular exaggeration of new media language in the print media. *Journal of Computer-Mediated Communication*, 11(3), 667-701. 2006
29. A. Tyack, & P. Wyeth, 'Designing for Team Awareness in MOBA Games: A Study in League of Legends.' In Proceedings of the Annual Symposium on Computer-Human Interaction in Play. 2020
30. J. Vahlo, J. Smed, & K. Kallio, 'Critical Features of Learning in Multiplayer Online Battle Arena Games.' *Transactions of the Digital Games Research Association*. 2017
31. L. S. Vygotsky, *Mind in society: The development of higher psychological processes*. Harvard University Press. 1978
32. P. Wouters, C. Van Nimwegen, H. Van Oostendorp, & E.D. Van Der Spek, A meta-analysis of the cognitive and motivational effects of serious games. *Journal of Educational Psychology*, 105(2), 249. 2013
33. H. Xia, J. Togelius, & K. Brink, 'Towards Team-Driven Learning in MOBA Games.' In Proceedings of the 13th International Conference on the Foundations of Digital Games. 2018
34. Z.J. Zhong, From smartphones to iPad: Power users' disposition to adopt mobile media devices. *Computers in Human Behavior*, 29(4), 1712-1718. 2013