

Emergence of Digitized Gamification as an Educational Tool and the Implications on Digital Literacy and Equity

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Abstract

The phenomenon of gamification has developed into a widely used educational tool over the last sixty years. In that time gamification has evolved from serious games, used to educate military personnel and medical workers, to a tool used to teach a variety of disciplines. The proliferation of gamification is particularly prevalent due to the ease of access and production of games in a digital format. Whether being used in the classroom or being used in daily life as a non-traditional learner, the common man is inundated with information and games that teach. Some games intentionally teach skills, however, even those that aren't geared towards teaching can teach peripheral skills and values that aren't easily taught in the classroom. Unfortunately, it is difficult to determine which games and content are going to be positive and helpful to growth and development, and which will not be. One such skill that would be invaluable to teach would be digital literacy, especially in such a digitized world. Thus the question posed here is whether gamification will be a reliable tool to teach digital literacy due to its success being implemented in other disciplines.

Keywords: gamification, digital equity, digital literacy, differentiated instruction

1 Introduction

The phenomenon of gamification is gaining momentum in the educational world today due, in part, to evolving technology. This evolving technology makes it easier to access and create games that teach a wide range of skills. These games may present as foundational games for skills such as phonetics, reading and math, to exploratory games like laboratory simulations for processes that may not be otherwise accessible to the students. As with many well created lessons, it isn't just the topic material that is learned, but other peripheral skills, and different types of games lend themselves to teaching different peripheral skills (Whitton, 2013).

“What exactly is gamification?” may be the next question that one asks themselves. What seems like an easy question, which should have an easy answer, actually has a multitude of answers. The literature is divided on what gamification can be defined as, or even what to call the phenomenon of taking game type elements and using them in non-game scenarios (Whitton, 2013). For the purposes of this paper, however, the definition used will be “using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning and solve problems” (Kapp, 2012, p. 10). While there are discrepancies on what gamification should be expressly defined as, the research largely agrees the use of games or game design mechanics result in overwhelmingly positive effects on learning (Whitton, 2013; Buckley et al. 2017; De Freitas, 2018). This research does not focus exclusively on technologically based games, there is abundant research that speaks to the effectiveness of role-playing games and in person simulations which are used in circumstances like preparing new teachers for the classroom (Overland, 2017).



With the invention, integration and innovation of the internet and other digital forums that can be used for education, there has been an influx in the use of games and gamification on a digital scale. This shift to internet and browser-based games allows the common man greater access to learning more varied information throughout their lives. Fortunately, or unfortunately, the ease with which blogs and videos can be created has caused users to be inundated with information, which can be difficult to slog through if one is not well versed in digital literacy. Digital literacy has been defined by the American Library Association to be “the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills” (Wright, 2013). Though digital literacy is not the only thing that can affect how much or little is taught and accessed, there is also the question of digital equity. Digital Equity being defined as “equitable access to the Internet and Internet-capable devices” (Katz et al., 2017).

When the era of digitization was in its infancy there wasn't a question of digital equity because these digital tools weren't necessary to do commonplace things such as get a job or complete schoolwork. It was a privilege to have a household computer or a cellphone; that is no longer the case. As digitization has been integrated into society, it is rare for one to be able to walk into a place of work and ask for a paper application and schoolwork is increasingly required to be word processed. Digital equity has come under further scrutiny recently due to the restrictions in place to stop the spread of the novel virus COVID-19. Due to COVID-19 digital equity, or inequity, has now become a question of whether a child will be successful in school and whether a parent or loved one will be able to keep their job while protecting their health. Thus, the purpose of this paper is to look at the use of gamification to successfully teach valuable life skills and how that may be applied to increasing digital literacy in an age where digital equity is becoming a necessity rather than a luxury.

2 Gamification

Gamification elements can be seen in educational traditions such as the spelling bee or roleplay. Roleplay in particular has been used to simulate anything from proper procedure in the face of natural disasters to communicating effectively and positively with co-workers. These instances predate the coining of the term gamification, as well as the technological innovations that led to the use of electronic gamification. Electronic gamification can be traced back to its origins in the late 1960's (Whitton, 2013). Educational gaming was developed after the first computer games were created. These early games were largely text based and modeled off of war-games, or in the case of Bartle's Multi-User Dungeon (MUD) released in 1966, a fantasy world where people interacted on the same server to affect the imaginary world put before them (Bartle, 2005). MUD was the precursor to what is now known as Massively Multiplayer Online Roleplaying Games (MMORPG's) and other types of online play where there are multiple users interfacing with the same world.

From the early days of the 1960's these entertainment and research-based games continued to develop until non-entertainment-based games were created in the 2000's (De Freitas, 2018). These games were coined as serious games, or alternate reality gaming depending on the literature, and began to be used more heavily in education, specifically for military training purposes and the training of medical professionals (De Freitas, 2018). Since then, the inclusion of games, particularly digital games, in education have become a prevalent topic and has seen the formation of numerous groups to promote this style learning in the classroom (De Freitas, 2018). This movement towards educational gaming has created ample opportunity for research on the effectiveness of gamification in the classroom. While the literature generally agrees that the effect of gamification is positive, there are still some considerations to take in mind when creating these types of programs for learners, traditional or non-traditional, to boost the effectiveness

(Whitton, 2013; De Freitas, 2018). One consideration to take into effect while creating these programs would be the type of player that is engaging in these games (Bartle, 2005; Buckley, Doyle & Doyle, 2017; Kocadere & Çağlar 2018).

As such gamification has a multitude of applications within educational settings and is commonly used in differentiated instructional practices (Redlo & Gilbert, 2019). Games have the potential to allow learners to interact with material based on their unique learning style, such as the ones identified in the VARK model: visual, auditory, reading/writing, and kinesthetic (Fleming, 2001). Allowing learners to interact with material in accordance with their learning style(s) will ultimately deepen their comprehension of fundamental 21st century skills, which are nicknamed the 4 C's: collaboration, communication, creativity, and critical thinking (Stauffer, 2020).

While many learners may have a natural aversion to collaborative work because of previous negative experiences with group projects, a game carries less weight on their overall course grade and is not as rigid as a project, allowing the learner to form new impressions of collaborative work (Elmassah, Mostafa-Bacheer, & James, 2020). Likewise, a collaborative game will require learners to communicate with one another, potentially orally and in writing. Games are a unique way of approaching education and even some long-standing games, which are not necessarily perceived as educational, have value in building skills such as creativity and critical thinking: this is especially true among role-playing games and strategy games. Critical thinking is shown to increase when skills are mastered and games which facilitate the application and practice of skills, such as role-playing and strategy games, will likely increase skill mastery and therefore, critical thinking skills (Stauffer, 2020; Overland, 2017).

As was stated earlier in regards to the ease of access with information, it has become easier than ever to access games that teach different skills specifically due to the creation of smartphones and app stores. In the author's experience, there is an app for just about anything one could want to learn, and if not an app, then a free online course through services such as Coursera or Khan Academy.

3 Discussion

According to studies done by Katz et al., 2017, the individuals who are most likely to be digitally illiterate are those whose demographic have less access to the tools that are becoming digital staples, for example calculators, personal computers and cellphones, across the many facets of life. The ability, or rather inability, to access these digital staples does not change the expectation for students to be able to complete their word-processed assignments or access their online work, or during these pandemic times, be able to meet on Zoom calls in order to further their education. For years the Library, school or community, has been a significant access point for those who suffer digital inequities (Nicholson, 2015). The Library has also been a resource used to increase digital literacy for those who may not have grown up as a part of the digital age, or who have not had the ability to access these digital devices frequently throughout their lives (Nicholson, 2015).

The novel disease known as COVID-19 has made it difficult to access some of these valuable resources. Without ready access to these public resources, it becomes much harder for working parents to be able to ensure that their children are getting the required Internet access in order to complete their education. In the face of this difficulty, many schools are working to try and ensure that all of their students have equitable access to both the internet and the digital tools that are quickly becoming required for success (RCSD, 2020). Just as school districts are working to keep students who suffer from digital inequity on the same playing field as those who do not, teachers are adjusting their delivery methods by integrating technology and games into their instruction to reach the students that they must now teach, at least part time, virtually. As teachers adapt these methods of delivery, they suffer from not having enough training,

resources, and peer supports in navigating the online environment (Redlo, 2020). In order to promote digital equity, it is imperative for educational leaders to provide teachers access to peer mentoring programs and online training software for integrating games into learning because when teachers are better prepared and more confident, student success will likely increase (Redlo, 2020).

The use of games in education (gamification) is particularly valuable for people with intellectual and/or developmental disabilities (IDD). Many students with IDD will require different instructional methods than other students to maximize their comprehension, which could take the form of an individual educational plan (IEP) or other means of differentiation (Ashby, 2012). The theory of differentiated instruction, which refers to using multiple teaching styles to meet individual students' needs, often incorporates gamification to help students develop deeper understandings of course concepts (Tomlinson, 2017). Games are an effective tool for taking dense information and scaffolding it into smaller sections, which can increase learner comfort with the material (Young, 2016). Moreover, games have been linked to increased learner achievement across learners of varying ability, which helps to level the playing field between students with IDD and those without IDD (Turan, Avinc, Kara, & Goktas, 2016). For students with IDD, games, and particularly games making use of virtual reality, are shown to increase their comfort level with trying new activities and/or investigating new ideas (McMahon et al., 2020).

4 Conclusion

While there is prolific literature on gamification, further study could be done to look at whether there is a correlation between the different styles of learner and the different styles of gamer as stated by Bartle in their 1996 and 2005 papers. A second study could be done to determine the best methods of delivery using the resources that currently exist in the community. As reliance on technology increases in this age of digitization, there grows a wider gap between the success of those who have equitable access to digital tools and those who do not. The emergence of COVID-19 has revealed how significant the issue of digital inequity has become. However, as stated, digital equity isn't the only concern brought into question. There is also the question of how to teach digital literacy to those who may not have had the opportunity to learn such skills. It seems clear that the path forward to mass proliferation of this much needed digital literacy will be through the very devices that individuals need to learn to access. Games and gamification show promise in being the teaching method that delivers lessons on digital literacy through the platform of the digital devices in question; a method that may attract and keep the attention of both traditional and non-traditional students.

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