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GAMING AND GAMIFICATION IN ACADEMIC AND LIBRARY SETTINGS: BIBLIOGRAPHIC OVERVIEW

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Abstract

Games, serious games, gamification or game-based learning are variations of a trend, which by the New Horizon report, in two to three years, will be part of the daily life in higher education. This projection is based on the fact that Millennials (born around 1980) and Generation Z (which follow the Millennials) have strong roots and persisting habits in electronic games. The issue of gaming and gamification in higher education is far from simply adopting the practices and products of the highly profitable and booming industry of games for leisure. Rapid technological developments make gaming a moving target. Gamification of the educational process requires deep theoretical knowledge of pedagogy and time- and energy-consuming application of these theories into practice. The complexity of gaming and gamification and diminishing resources in education require increasing collaboration.

Keywords: gaming, gamification, game-based learning, GBL, serious games, Bring Your Own Device, BYOD, mobile devices, Millennials, Generation Y, Generation Z, academic libraries, education, assessment, badges, leaderboards

1 INTRODUCTION

Games are a type of cooperative learning. Games embody the essence of constructivism, which for students/gamers means constructing their own knowledge while they interact (learn cooperatively). Learning can happen without games, yet games can accelerate the process. Games engage. Games, specifically digital ones, connect with digital natives, those born after 1976-80, who are also known as Generation Y, or Millennials (Howe & Strauss, 2000).

Millennials in the United States, as per the recent *Programme for the International Assessment of Adult Competencies* (PIAAC), are performing rather poorly compared to their peers from 22 countries around the world (Schaffhauser, 2015b). While research is still tackling the reasons, novel approaches to learning need to be considered for a generation that differs from previous generations in approaches to acquiring information and constructing knowledge.

Millennials are gradually leaving educational settings and entering the working force, to be replaced in schools by Generation Z (Levine & Dean, 2012). Gen Z, the next digitally-native generation, expects changes to the learning process; changes even more drastic then the ones demanded by the Millennials (Hackschooling, 2013). Gaming for Generation Z is not an alternative, but rather an expectation. Gaming for Generation Z is associated with creativity (Jackson, A., Witt, Games, Fitzgerald, von Eye, & Zhao, 2012). Creativity, next to collaborative learning and knowledge construction, is one of the prevalent characteristics

of games. Using games increases learning, creating games increases learning more and is "tantamount to project-based learning" (Shapiro, 2014b).

Games and gamification of the learning process evolves from cutting edge ideas to regular expectances. Beyond a fad or choice, they become, next to lecturing, expected teaching methods that we, the older generation of educators, will have to consider as a feasible alternative to t h e   traditional lecture.

2 GAMES AND GAMIFICATION; DEFINITION AND DELINEATION

2.1 Games

Ralph Koster defines a game as a system of rules that, taken together, creates a simplified model of some aspect of reality (Koster, 2013).

2.2 Serious Games

In the last decade, the notion of "play" in education, as discussed by Vygotsky (1978), was ren[fr]amed to "games." During the same decade when "game" replaced "play" in regard to learning practices, the term "serious games" was also introduced. Ulicsak and Wright (2010) define serious games as simulations and virtual worlds. They quote Sorensen and Meyer's (2007, p. 559) definition of serious games as "digital games and equipment with an agenda of educational design and beyond entertainment" (Ulicsak and Wright, 2010p. 24). Further, Ulicsak and Wright (2010) provide a long and excellent selection of definitions and literature regarding serious games.

Similarly, the European Alliance for Innovation (EAI) (http://eai.eu/transaction/serious-games) defines serious games as "not designed for the sole purpose of entertainment but rather for training, educational, marketing or awareness raising objectives. These [serious] games are designed to create a skill development environment for the player while retaining the same focused motivation context of 'fun' games. The player must perform tasks, analyze processes and draw conclusions in order to increase his/her productivity and knowledge following the game's positive and negative feedback, sometimes after risks or events that, in real life, would be harmful or even fatal. Serious Games are used in numerous areas like engineering, health, education, defense, military, emergency management, and scientific exploration, among many others."

2.3 Gamification

Gamification takes game elements (such as points, badges, leaderboards, competition, and achievements) and applies them to a non-game setting. It has the potential to turn routine, mundane tasks into refreshing, motivating experiences (What is GBL (Game-Based Learning)?, n.d.).

Gamification is defined as the process of applying game mechanics and game thinking to the real world to solve problems and engage users (Phetteplace & Felker, 2014, p. 19; Becker, 2013, p. 199; Kapp, 2012). Gamification requires three sets of principles: 1. Empowered Learners, 2. Problem Solving, 3. Understanding (Gee, 2005).

Some authors, e.g. Malykhina (2014), fail to make the distinction between games and gamification in the educational process and attribute gamification to the influx of games in the curricula, rather than to the application of game elements as defined above or constrain the definition ascribing only reward system to learning settings and contexts (Darvasi, 2015).

An excellent outline and historical and bibliographic overview of games and gamification in their learning context was recently published by Liu and Santhanam (2015). As per Liu & Santhanam (2015), there are certain "commonalities between gamification and other game-related designs, but they differ in terms of whether they are predominantly work-oriented (versus play-oriented) and whether they have well defined goals and structures" (p. 6). They also offer a useful framework, describing the roles of different gamification design elements.

2.4 Game-based learning

Game based learning (GBL) is a type of game play that has defined learning outcomes. Generally, GBL is designed to balance subject matter with gameplay and the ability of the player to retain and apply subject matter learning in the real world. GBL describes an approach to teaching, where students explore relevant aspects of games in a learning context designed by teachers. Teachers and students collaborate in order to add depth and perspective to the experience of playing the game (What is GBL (Game-Based Learning)? (n.d.). Researchers are readily taking GBL to the next DGBL level (Digital Game Based Learning) emphasizing the fact that Millennials and Generation Z have affinity to electronic and online games as compared to "in-person" games (Tsai et al. 2015).

In the past decade, the education-based definitions of "games' are being deconstructed and changed: besides serious games, gamification and game-based learning, practical solutions by instructors in their

attempt to introduce games as learning method spur new "definitions. E.g. game-enhanced learning, portrayed as a misnomer of game-based learning by Barseghian (2014) can be safely included in "gamification." One of the challenges that must be addressed is a standardized definition and classification of "educational games" and their subdivisions, such as game-based learning, serious games and gamification.

2.5 Boards or in-person games and activities

Board games or, as per Margino (2013), "in-person games and activities" (p. 335) are not the focus of this research. Instead, this bibliographic overview concentrates on the rapidly burgeoning topic of online games, promoted through educational organizations such as Mindshift (https://www.facebook.com/MindShift.KQED, http://blogs.kqed.org/mindshift/). In-person games and activities do have and will keep their place in educational settings, particularly in academic libraries. However, considering Millennial and Gen Z propensities toward electronic games, it is reasonable to focus efforts on providing them with a natural milieu where they can apply their learning efforts more easily.

3 GAMING IN EDUCATION

In the last two decades, there has been a proliferation of literature on gaming in education. This bibliographic overview is limited to recent literature (the last five to ten years). In view of the technological advancement of games, literature from the turn of the century (e.g. Griffith, 2002) is replaced by more recent studies (e.g. Granic et al, 2014).

Gaming in education is recognized with the potential to promote student motivation and problem-solving skills (Eseryel, Law, Ifenthaler, Ge, & Miller, 2014). Game-based learning (GBL) is attractive to Millennials and Generation Z with the opportunity to bring fun to learning. Malone and Lepper's taxonomy of intrinsic motivation provides evidence to prove that games hold keys to the improvement of learning, in ways that other teaching methods might lack (Mozelius, 2014; Tsai, Tsai, & Lin, 2015). Gaming, according to Thomas Malone's and Mark Lepper's taxonomy, offers opportunities to stimulate students both on the level of internal motivation and on the level of interpersonal motivation (Ciampa, 2014; Mozelius, 2014). Motivation and other factors are laid out and discussed in length by Bellotti et al. (2013).

Gaming is an excellent complement to the constructivist approach as defined by Vygotsky (1978) and Bruner (Ratner & Bruner, 1978). Using online games, such as Minecraft EDU (http://minecraftedu.com/), furthers the advantages of constructivist methods in the teaching and learning process (Overby & Jones, 2015; Shapiro, 2014a; Games in the Classroom, n.d.; Hill, 2014). Minecraft and SimCity (http://www.simcity.com/en_US/simcityedu) are games taken by increasing numbers of users to their mobile devices, confirming the necessity to explore the connection between educational games and BYOD.

The popularity of Minecraft EDU and SimCity EDU should not leave the impression that games and gamification are applicable only to "exact" or "hard" sciences; art and humanities will benefit no less from "non-linear networked communication" (Shapiro, 2014b). The recent momentum around the formation of digital humanities will certainly include the educational value of games and gamification (Editors' Choice: Digital Humanities and Game Studies Round-Up | Digital Humanities Now, n.d.).

The popularity of Minecraft EDU and SimCity EDU with the younger generations inevitably engenders acceptance among educators (http://blog.stcloudstate.edu/ims/?s=minecraft) (Malykhina, 2014). Ulicsak and Wright (2010) identify the lack of uniform pedagogical research on educational games and note the discrepancy between earlier educational games, based on behaviorist models and recent attempts to shift educational games to experiential, situated and socio-cultural pedagogical models.

Regrettably, this growing academic interest toward games and gamification in education remains confined within research, but has difficulty being applied broadly in practice. There is a dichotomy between the research asserting the usefulness and necessity to embrace gaming and gamification and the need to conceptualize it from different learning theory perspectives (Turkay, Hoffman, Kinzer, Chantes, & Vicari, 2014; Vrasidas, & Solomou, 2013). There is also the important factor of the overall instructor's hesitation to embrace gaming and gamification in their curricula (Perrotta, Featherstone, Aston, and Houghton, 2013, p. 18).

According to their comprehensive literature review on gaming in education, researchers demonstrate that gaming as an educational method is built on sound learning principles, such as continued practice, clear goals and immediate feedback. It is demonstrated that games provide opportunity for personalized learning and 21st century skills. It is not only what students need to learn that is shifting, but also how and when they learn (McClarty, Orr, Frey, Dolan, Vassileva, & McVay, 2012).

The above-mentioned NFER report reflects the effort of the British-based National Foundation for Education Research (NFER) Program to determine the role of game-based learning in the educational process and, respectively, to map the activities and efforts to integrate game-based learning in the current educational practices. Another British-based organization, the Serious Games Institute (http://www.seriousgamesinstitute.co.uk/), aims to provide practical solutions, guidance and literature. The

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European Alliance for Innovation (EAI) is also enabling research regarding "serious games" (http://eai.eu/transaction/serious-games). The Wilson Center in the United States is supporting exploration of serous games (http://www.wilsoncenter.org/publication-series/serious-games). Arizona State University hosts the Center for Games & Impact (http://gamesandimpact.org/) with a wide range of theoretical and practical expertise. The University of California is sponsoring the Center for Digital Games Research that focuses on digital media and games from a multidisciplinary approach (Bolkan, 2015). Such centers at educational institutions are indispensable for bridging the aforementioned dichotomy between games' potential on one side and theoretical perspectives on the other, as well as closing the gap between theoretical research and wide-spread practical application.

Organizing and developing educational gaming is moving beyond government and academic support; organizations such as E-Line Media (http://elinemedia.com/), the Institute of Play (http://www.instituteofplay.org/) and the MacArthur Foundation (http://www.macfound.org/) are backing enterprises such as Gamestar Mechanic (https://gamestarmechanic.com/), which focus on gaming and how-to-make-games in educational settings (Shapiro, 2014b). With opportunities such as Gamestar Mechanic, the educational world is moving from client-based (Scratch, http://scratch.mit.edu/ and Alice, http://www.alice.org) to the next, cloud-based/social level of game creation such as MineCraft and SimCity. The cloud-based transition in gaming evolution resembles the shift from "one-to-one" to "many-to-many and multi-way interaction" and parallels the opportunities offered by social media, as eloquently explained by Anderson, & Dron in the first chapter of their book (2014, p. 10).

As Ulicsak and Wright (2010) correctly observe "[j]ust because some players learn these skills playing the game, that does not mean either that most players are also learning these skills or that it should be adopted in a leadership development program. Conversely, a purely educational simulation may not be very much fun. The program may have the three-dimensional graphics and motion capture animations of a computer game, but the content may be frustrating" (p. 19). And vice versa, a fundamental difficulty with transitioning games from the entertainment world to education is related by Granic et al (2014, p. 74) as the "chocolate-covered broccoli" problem— "the games look great, they are good for you, but they ultimately fail to work because the creative game dynamics that induce transportation and immersion are missing, making them simply not fun (Granic, Lobel, & M. E. Engels, 2014, p. 74).

4 GAME-BASED LEARNING AND LIBRARIES

The academic library has an important role in establishing gaming and gamification as a legitimate learning approach. The following factors identify the library as the developmental hub for game-based activities in education: 1. The academic library serves [and reaches] the entire campus. 2. Academic librarians teach mostly short sessions, which is an advantage to start and complete a rather complex implementation of game-based activities in the curriculum process. 3. The development of sound pedagogical gaming by librarians can enable them to service and consult departments across campus in replicating the pedagogical success of applying gaming and gamification in the curriculum process.

As reflected in the NFER initiative, teachers' attitudes toward gaming are critical factors in the success of gaming practices (Perrotta, Featherstone, Aston, and Houghton, 2013, p. 18). Therefore, a limited and controlled endeavor to gamify the learning process on a small scale, e.g. bibliographic instruction for undergraduate classes in different disciplines, can steer faculty's attitude in a valuable direction and affirm the utility of gaming in learning.

Gaming in libraries can be divided in two broad categories: physical (also board, or in-person) and electronic/digital/online games. Both categories deserve consideration in the educational efforts of the library, yet considering the preferences of Millennials and Generation Z; preference must be paid to the second category. There is no shortage of literature on how to approach both in-person and online games at the library. Nicholson (2013) presents a comprehensive historical overview of the application of tangible games in the American libraries. Margino (2013) presents an anthology of library games; in-person, virtual and hybrid. Similarly, Kirsch (2014) published essays with a comprehensive approach toward in-person, virtual and hybrid games. University of Minnesota Libraries' practical guide to video games is an example for the electronic/digital/online category (Rauber, Farrell, & Neeser, 2014). So is the Web site for the Library Technology Conference 2015 (https://sites.google.com/a/umn.edu/learninggame/home). In a similar fashion, Canadian academic librarian, Olivier Charbonneau offers collection of similar information on his site: http://outfind.ca/2015/04/15/what-about-games-in-academic-libraries/

The support to develop elaborate educational games is incomparably small to the funding for gaming entertainment industry. The lack of finances makes it only logical for an academic institution to combine resources across campus in an effort to establish gaming and gamification as a recognized approach to learning and teaching. In that sense, the beginning of this paragraph proposes a logical approach to using the academic library as the hub of such combined efforts.

Within the campus setting, the library can prove to be the preferable sandbox for possible testing and implementation of game-like activities and projects. Academic libraries are well known as early adopters of new practices on each campus. Using games for fostering information literacy skills among students has been underway for a long time (Smith, 2007; Walker, 2008; Markey, Swanson, Jenkins, Jennings, Jean, Rosenberg, & Frost, 2009; Nicholson, 2010; Buchanan, & Elzen, 2012; Forsyth, 2012; Porter, 2012; Becker, 2013; Brown & Kaspar, 2013; Margino, 2013; Thomas, & Clyde, 2013; Phetteplace & Felker, 2014; Walsh, 2014a).

Regrettably, information literacy skills remain the focus of most academic libraries in the 21st century. Skills regarding digital literacy can elude academic librarians. Considering the importance of gaming in education, Alan Gerschenfield, a publisher of computer games, underlines the connection between games in education and the importance of teaching digital literacy (Fletcher, 2014); a literacy, which academic libraries often neglect in favor of information literacy. Not surprisingly, such discrepancy regarding the importance of digital literacy determines the attitude toward the leadership role of the academic library in game-based learning practices on campus. Buchanan & Elzen (2012) are of the opinion that librarians do not have to be experts in the "gaming" area. In their opinion, librarians need to only understand the place video games could have in libraries and adjust their services accordingly. In the same fashion, Phetteplace & Felker (2014) fail to see the grand responsibility of the academic library on campus as early adopters and in terms of video games; they advocate only engagement of patrons and outreach programs. On the other hand, Becker's (2013) study of gaming in libraries takes him to Shapiro's (2014b) conclusion, namely, the necessity to help students address the learning challenges by creating their own games and/or supporting students in co-designing and manipulating games.

It is important to note, though, that researchers' emphasis on traditional library services is becoming obsolete and that it is necessary to promote reinvented library services such as game-based learning (Felker, 2014; Phetteplace & Felker, 2014).

Academic librarians' most applicable contribution toward game-based learning is library instruction. Margino (2013) recognizes the stagnation of existing library instruction, which "primarily exhibits lecture-style teaching and consequently results in students' roles as passive observers rather than active participants," (p. 334) whereas the Millennials' expectations are for "service, immediacy, interactivity and group activity" (Oblinger, 2003, p. 45). As recommended by Schiller (2008), "instruction librarians who wish to teach information literacy to upcoming generations can benefit from looking at video games...because they are an emerging media that play a central role in the development of the current generation of college students" (p. 351).

Similar attitudes toward the reversal of lecture-based library instruction toward a game-based one are shared by other advocates for game-based library instruction (Broussard, 2012; Martin, & Steinkuehler, 2010: Porter, 2012; Smale, 2011; Walker, 2008). In addition to library instruction, Phetteplace & Felker (2014) identify library orientation and resource usage as potential fertile ground for turning library services from "traditional" to gaming. Porter (2012) confirms Walker (2008) and Schiller (2008) findings about the use of gaming and gamification in the library.

The traditional services of library instruction and library orientation overshadow the relatively young role of online/distance/mobile education services, the traditional role of academic library on campus. Porter (2012) emphasizes that library instruction for online education need to include synchronous and asynchronous demonstration of "proficiency in the use of current information and communication technologies" (p. 68). Game-based learning, per previously mentioned didactic advantages, can be the fitting environment to deliver the expected proficiency for online and distance learning (Nielsen, 2014).

There is no singular approach to game-based learning in academic libraries when it comes to the selection of gaming environments. E.g., Vrasidas, & Solomou (2013) propose the use of Quest Atlantis (www.questatlantis.org). Walker (2008) suggests simpler approach using a Jeopardy-like game. The authors of this study have adapted the Brandel Library's game-based library orientation for students' mobile devices (http://web.stcloudstate.edu/pmiltenoff/bi/); an inexpensive and replicable approach to gamifying library orientation. Among the advanced and elaborate endeavors for game-based library services is the University of Michigan's Bibliobouts. With their shrinking budgets and overworked staff, few academic libraries can afford allocating an entire team to accomplish a product such as Bibliobouts. Step-by-step instructions on how to employ Bibliobouts in library instruction sessions are already made available by librarians (Hofer, 2013).

Creating in-house games such as Bibliobouts can be an expensive endeavor and most institutions do not have the rich organizational support or financial resources as the University of Michigan to embark on such projects (Spina, 2014). Building a game-based learning experience in an academic library and, respectively, for campus classes, can be accomplished using newly emerging platforms, such as Koondis (Schaffhauser, 2015a). The advantage of Koondis, described as "social homework system," over existing LMSes, such as Blackboard and Moodle, is better management of the discussion forums and more effective organization of students into groups, where they can themselves gamify the learning experience and, as already mentioned,

students creating games learn better than students just playing games. It seems that products like Koondis epitomize the best of the old world of LMS and the new world of social media to provide students with opportunities for new type of learning, which includes game-based learning.

In addition to the examples listed above, the following Web page offers a conspicuous account of examples for games in libraries: http://gamemakinginterestgroup.wikispaces.com/Library+Game+Examples. The authors of the Web page list games to enable learning in libraries. The Web page also offers sources for building games in the libraries and, as previously mentioned, per Shapiro (2014b), "with game design students take metacognition to the next level, learning how ideas are constructed." Further, University of Alabama's Project Velius, provides an opportunity to engage students in library orientation by involving them in a sort of online mystery scenario. Spina (2013) recommends SCVNGR platform and Walsh (2014b) recommends Lemontree (https://library.hud.ac.uk/lemontree/). However, SCVNGR has been pulled from the market (by 2015, Google had retired SCVNGR) and Lemontree seems to have remained a locally-used platform.

The literature on gaming and gamification inevitably and rightfully focuses on student learning. However, with the increasing influx of technology in professional duties, library staff and faculty themselves can benefit from gaming and gamification for updating and upgrading their skills. Stephens and Johns (2015) propose "utilizing concepts such as self-directed learning, play, and an emphasis on lifelong learning, these programs have been offered for individual libraries as well as consortial and state level iterations to reach thousands of library staff. Benefits to staff include increased comfort with emerging technologies and an increased desire to continue learning (p. 348). The best way for the academic library to become the hub and leader for game-based education is for staff to practice games and gamification (play) itself.

The goasl of a gaming imitative at an academic library must include long-term research on how to bridge "leisure time experiences and practices into the formal educational domain" (Perrotta, Featherstone, Aston, and Houghton, 2013, p. 25). Hayman, & Smith, (2015) leave wide open the decision whether to adopt emerging technologies, such as games and gamification: "Educators, practitioners and researchers must be willing to consider whether our own libraries and institutions can and should support these trending technologies" (p. 8). They draw attention to the fact that there is not only the hardware and software to consider but also the staffing of relevant positions. The concept of flow, introduced by Csikszentmihalyi (1990) describes a state of mind when someone is completely focused on a task; a task that has a purpose. An academic library that only hosts games for leisure provides a welcoming but insufficient endeavor, considering the opportunities described by Csikszentmihalyi's "flow" concept and supported by the literature presented in this research. At any moment, the goal of the academic library should be to elevate the foundational entertainment elements of leisure when gaming and bring it to the higher purpose of connecting with the respective discipline(s) of the student while enticing the student to participate in the game-based learning process.

For informal assessment of information literacy, McCulley (2009) suggests "active-learning library sessions" (p. 175). Games and gamification of instructional sessions is one of the best approaches for active learning, since it involves each student actively in the acquisition of content and builds skills. Gaming using electronic means, such as a library instruction session designed for mobile devices (http://web.stcloudstate.edu/pmiltenoff/bi/) replaces McCulley's (2009) classroom assessment techniques such as 3x5 cards, bypasses unnecessary data entry, and integrates the assessment process into all-electronic streamlined data, which can be readily exported for further analysis using Excel, SPSS or any other statistical tool set.

Bluemle, Makula, & Rogal, (2013) study the effectiveness of information literacy among first-year students. Their research stresses the importance of moving from a quantitative form of assessment to performance assessment using Gilchrist and Zald's model for instructional design through assessment. There is a large volume of research on changing assessment tactics in regard to learning in academic libraries (e.g. McCulley, 2009; Mullins, 2014), which can be placed in the context of gaming and gamification. In that sense, Frederickson (2013) posits, "micro- credentialing" through digital badges is an excellent start in the library field. Gaming and gamification as a new learning approach is tightly connected to the need for new ways of assessment. Efforts such as the Library Impact Data Project (http://crl.acrl.org/content/74/6/546.abstract) can include in their future projects assessment of gaming in the library and how it correlates with student success and library usage

5. CONCLUSIONS

Learning must not be confined in "educational" games and only involve "leisure-use" games (Perrotta, Featherstone, Aston, and Houghton, 2013, p. 6). Yet learning is also an effort well beyond just offering learning to play the games, those being either "educational" or "leisure-use" ones.

The success of the gaming industry, beyond having enormous financial support, which education lacks, is shaped by the absence of the restraints of educational content. Gaming and gamification of education is and

will not be an easy process: a game that is fun but has poor content is not a desirable product (Ulicsak and Wright, 2010) and vice-versa, a game with robust content that does not engage the student is equally incapable of achieving learning goals. In other words, the "chocolate-covered broccoli" problem— the games look great and are good for you will ultimately fail because the creative game dynamics that induce transportation and immersion are missing, making them simply not fun (Granic, Lobel, & M. E. Engels, 2014, p. 74). "Thus, the question for psychological research on gaming is not what games are "good" or "bad" for us; rather, it seems important to start by acknowledging the growing complexity and interactivity and, from there, to develop equally complex models to explain how gaming influences players in relevant cognitive, social, and emotional domains" (Granic, Lobel, & M. E. Engels, 2014, p. 74).

Gaming for educational purposes should not be constrained only within consoles (e.g. Sony, Xbox, Nintendo), but online games such as SimCiy 'EDU' and MinCraft 'EDU' also must be considered (Perrotta, Featherstone, Aston, and Houghton, 2013, p. 7). A comprehensive approach to games and gamification is needed, that includes not only games with consoles and online games, but a deep understanding of the BYOD movement and how to adapt the use of personal mobile devices toward game-based learning. In addition, to use this comprehensive approach we must understand and connect the new opportunities for assessment in the gamification process and in game-based learning. Last but not least, consideration of the game-based learning process must leverage student participation and their ability to create learning games. As outlined by Kapp (2014), incorporating gamification into the learning strategy should not be simply "a bolt on" of meaningless, superficial game elements" (p. 52).

The movement around game-based learning can be an expensive and time-consuming process. Few are the educational institutions that can afford to devote appropriate time and resources. It is good planning to consider entities, such as the academic library as the forefront and, consequently, the hub of such activities, as well as to support and affirm cooperation between departments, pooling resources to jump start game-based education.

Gaming goes to the core of constructivism as defined by Vygotsky, Piaget and other last-century scholars. Rapidly emerging centers and organizations around government and educational institutions put great effort into streamlining the enormous task of connecting the vast area of gaming and the complex environment of education to fulfill game-based learning's promise. Adoption of rules and guidance such as the principles and mechanisms of game-based learning from organizations, such as the NFER Research Programme, can provide useful frameworks (Perrotta, Featherstone, Aston, and Houghton, 2013, p. 8) and the necessary start-up resources to develop and implement GBL in education.

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