



EDUCATIONALLY GAME-BASED LEARNING ENCOURAGES LEARNERS TO BE ACTIVELY ENGAGED IN THEIR OWN LEARNING

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ABSTRACT

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In our schools and universities today, learners have been exposed to a lot of technology applications. Therefore, the natural order of learning could be enhanced by the use of games. Using games through the application of technology provides the learner with lots of hands-on activities. Game-based learning activities are highly engaging and it helps the student learner to find ways of solving problems by various means. Using technology game-based learning devices give the learner also immediate feedback of a skill obtained or mastered. Educationally game-based learning is designed with the purpose of helping the learner to interact within an organizational experience by learning skills and knowledge to improve literacy. Educationally game-based learning is just another way to incorporate learning through the instructional process facilitated by teachers. Teachers must continue to seek ways to address how learners learn best. By using game related activities, the teacher has the opportunity to add value to a variety of instructional enhancers. With the effort of improving literacy across disciplines, teachers can use game-based devices to motivate and engage student learners more in their own learning. Students are motivated to learn and to be engaged in their work when the work has meaning, relevancy and is linked to real-world application.

1. INTRODUCTION

Today, teachers have a broader range of delivering instructional services to students. With the continued availability of technology being used as a tool in many educational settings, teachers in schools have access to utilizing a variety of ways to reach the needs and interests of students individually or as a group (Chow *et al.*, 2011). Teachers are able to personalize their instructional delivery services to a diverse group of students with multiple-learning styles by using technology applications. By using educational game-based learning devices, this affords teachers another way to fully engage students in their own learning, improve retention and decision making (Chow *et al.*, 2011).

Video games, for example, are highly engaging. There is a great interest by many educators in how to harness the power of video games and other technology to support teaching and learning in schools. Researchers have studied educational video games and simulations to determine how they can effectively support the instructional

process (Aguilera and Mendiz, 2003). Learners have different learning styles and the use of game-based learning gives the teacher optional ways of providing learners with many modalities in addressing the learner's specific learning need. If planned well and implemented with learners in mind, the teacher can begin to find a variety of ways to be innovative by offering learners choices in how they may wish to engage in their own learning and how to solve problems during their learning experiences in mathematics and other disciplines in and out of the classroom (Kebritchi *et al.*, 2010). Using game-based learning activities, teachers are able to personalize their instructional delivery services to a diverse group of learners with multiple-learning styles. By using educational game-based learning, this affords teachers another way to fully engage students in their own learning (Krumholz, 2011).

There are pros and cons about the validity of a teaching tool using a game. Whatever it may take to get learners interest in learning is vital in the educational and home environment. Based on research, nearly 65 percent of learners are motivated to learn when using an electronic device or tool. Based on a national survey over 75 percent of teachers k-8 grade are using game-based learning tools in schools to enhance the instructional delivery process. (Cooney, 2015). However, the effectiveness of game-based learning from an evaluative point of view regarding success for learner outcomes is still under scrutiny by many researchers.

By using game related activities, the teacher has the opportunity to add value to a variety of instructional enhancers. With the effort of improving literacy, the teacher can use games to help the learner gain a variety of literacy experiences in an engaging and confident manner in a number of subjects or disciplines across the curriculum. Using a variety of games does not have to be expensive. Teachers could select some off the shelf games or online games, if incorporated properly, could be effective for use to drive learning performance and instructional activities (Sandford *et al.*, 2006).

The intent of this study was to give qualitative research findings related to game-based learning. This study focus specifically on definition of game-based learning, theorists and framework, value and benefits, learning strategies, simulations and application, literacy booster, motivation and engagement, linkage and impact, how scholarly significant is game-based learning and future recommendations.

1.1. Definition of Game-Based Learning

By definition, digital gaming can be simply expressed by being an interactive multimedia with dynamic elements that are under the control of the learner or teacher. Many digital games may be given repetitive action on the part of the user. The games and simulations are highly interactive. With many users, the controlled features of digital games are major reasons why learners enjoy using such devices. Learners can enjoy manipulating digital gaming control devices. If structured properly, learners can participate in mastering relevant educational information in class that is academically sound (Rieber *et al.*, 2004).

Educationally game-based learning is designed with the purpose of helping the learner to interact within an organizational experience by learning skills and knowledge to improve literacy. Educational game-based learning is just another way to incorporate learning through the instructional process. Teachers, however, must continue to seek ways to address how learners learn best. By using game related activities, the teacher has the opportunity to add value to a variety of instructional activities. With the effort of improving literacy, the teacher can use games to help the learner gain a variety of literacy experiences in an engaging manner in a number of subjects or disciplines across the curriculum (Kebritchi *et al.*, 2010).

1.2. Video-Games and Student Learning and Academic Achievement

There are a number of studies that focus and aim to test a variety of hypotheses regarding impact or effectiveness of game-based learning. Several of the studies acknowledged having limitations in the current evidence-base regarding academic achievement using game-based learning activities. There are many game-based

learning devices that are used in the art and science of teaching in the future; therefore, teachers must stay up-to-date and be comfortable with their game-based knowledge and skills. In essence, teachers must also be literate regarding the use of and power of game-based learning devices for instructional delivery services to student learners (Sanford and Madill, 2007). Teachers should be aware of appropriate assessment instruments for teaching and learning that have been tested for assessing students' work when using gaming devices. The question continues to prevail that there is a need to find or design an instrument with validity and reliability to test to "what extent" are game-based devices effective for increasing students' academic achievement. The second question maybe "how long" are games effective or is it determined by the game itself, the user or the purpose of the game? Are students motivated a "long period of time" when participating in game-based learning? There are a number of questions regarding game-based learning and the impact of game-based learning on critical thinking and problem solving skills. Some studies place more emphasis on the impact of student motivation and engagement which is the overall focus of this research regarding the use of video games. However, the biggest challenge for researchers is to determine the relationship between video games and students' actual learning a skill or gaining academic knowledge. A study by Miller and Robertson (2011) investigated the impact of game-based learning and its impact from previous studies. It appears that the elements of video-games, instead of the video-games verses video-games could not quantify the outcome of learning and achievement (Shelton, 2009). A lot more work will have to be done over a period of time or years in an ideal setting to find out more information about the impact of video-games on learning and student achievement academically. Future researchers would have to gather and validate reliable data from the academic achievement of students, their cognitive performance and students' measurable knowledge and skills gained to come close to a more realistic impact of how video-games contribute to student learning and academic achievement. There is a need to infuse specific key competencies in the game-based learning environment based on the discipline to determine through student modeling to what level are the gaming activities promoting or influencing student academic achievement (Shute *et al.*, 2009). A number of academic activities using specific data must be used to assess students' interactions, manipulation of games and the calculation of the interactions, successes and failures must be collected, analyzed and posted for a period of three to five years. This generates large amounts of data that, if correctly analyzed would allow researchers and educators to make more informed decisions about the effectiveness of video-game being used by students and the academic achievement level acquired (Miller *et al.*, 2011).

1.3. Purpose of this Study

The purpose of this study was to identify factors that encouraged learners to be actively engaged and motivated in their own learning by using educational games. This study further states the values and benefits of game-based learning that promotes simulated experiences prior to an actual real-life experience for students. This study contributes to existing literature based on motivation and engagement. However, this study does not try to quantify that using game-based learning devices improve student academic achievement.

1.4. Research Questions

This study was guided by one research question as follows: Do educational game-based learning devices encourage learners to be actively engaged in their own learning?

1.5. Research Design

In this study, qualitative data were collected and analyzed by the authors from articles, scholarly journals, reference books and other relevant sources. The authors for this study presented a snapshot view of how game-based learning experiences can go from theory to practice, simple to complex problem solving and to create collaboration for learning communities for students (Reeves, 2000).

1.6. Impact Factors of Game-Based Learning According to Many Theorists

In the learning environment, game-based learning can help to motivate students especially when students are participating in competitive activities. According to Rai and Beck (2011) especially in mathematics, game-based learning has no meaningful impact on student academic achievement. However, other theorists believe that online-based game models used for education, motivation has a direct correlation with improved outcomes of student learning academically (Chen *et al.*, 2012).

It is strongly suggested that the teacher's enthusiasm in the integration of game-based learning is a key factor also in the academic success of students (Kebritchi *et al.*, 2010). Classroom games also increase teacher motivation, but a broader scale show their effects on classroom successes are unclear at this time. What is important is to align game-based learning activities with the educational game devices being used when designing an approach to the instructional delivery process (Shelton, 2007). The quality of classroom instructional tools used is strongly influenced by teacher effectiveness. So the game-based learning device by itself does not effectively increase student academic achievement. In essence, the teacher is still the chief facilitator and instructor for the delivery of appropriate and effective instructional services in meeting the needs of each student.

A study conducted by Reese and Wells (2007) stated that games can cause motivation and for some achieving learners to become more so and others unmotivated and underachieving learners. Nevertheless, using game-based learning devices have an overall positive effect on learners' confidence and achievement.

Looking at outcomes, matching theoretical games can help to organize and assess their efficacy in achieving learning goals. Game theory can be used to assess classroom resources and materials by the effect on motivation as well as learning targets (Wilson, 2009). Many theorists have been identified within this study; however, the authors believe that there is no substitute for high quality teaching in all learning environments. The teacher is the key individual in helping learners to participate in meaningful learning experiences in a productive manner for their own learning. Again, the teacher is the key to guiding and facilitating effective teaching and learning even when games are used in the process (Becker, 2007).

1.7. Digital Game Theory

The digital game learning theory enables the user to engage in and experiment with practical game designs (Becker, 2005). The user of the game will also be able to explore theories and concepts which can be used to analyze the formal characteristics of games and use them in different learning environments. The concept and use of games can bring different types of pleasure and value to the user in a contemporary environment (Professor Richard Bartle, University of Essex). Game-theory can be used to gauge the effectiveness of the curriculum methods as well as having an impact on motivation and achievement (Stull and Mayer, 2007).

Addressing the framework's micro-level of game-based learning suggests that the learner's challenge is to solve the problem and have knowledge of the nature of the intended focus of a specific game and the possible action in order to reach the desirable outcomes as instructed by the teacher (Marzano, 2007). However, identifying a suitable framework for game-based learning has not been easy based on the views of designer, because each game may differ in the target game genre and information may not be applicable (Choi *et al.*, 2012). When learners through trial and error explore learning that can lead to the skills and knowledge gained from the game being played, that is a positive result. The learner is also motivated by the pleasure of mastering the game, because the learner feels in control of his/her efforts (Koster, 2005).

1.8. Benefits of Game-Based Learning

Learning games can help students to contextualize and apply lesson contents to themselves and real life application. A common definition for contextual intelligence to promote learning is the ability to quickly and intuitively recognized and diagnose the dynamic contextual variable inherent in an event. Secondly, circumstance

and results with intentional adjustment of behavior in order to exert appropriate influence in that context is another benefit to game-based learning (Abrams, 2009).

Competitive game-based learning can provide extra motivation to reach goals in a learning setting, especially when learners are made aware of extrinsic motivation according to many theorists (Burguillo, 2010).

There are many benefits to using game-based learning devices and game-based learning conceptually in Figure 1 as follows:

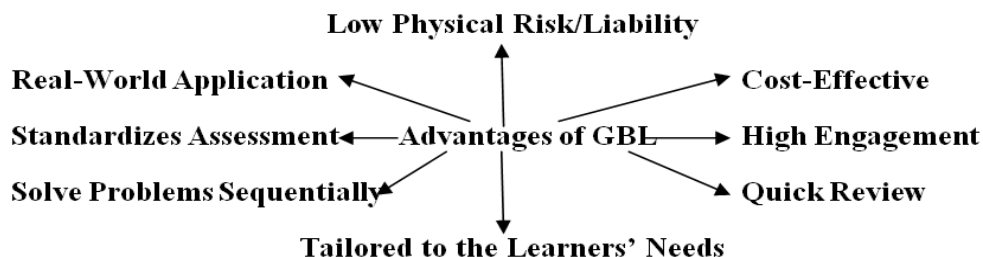


Figure X: Adapted from the New Media Institute, New York, N.Y. 2015

Figure-1. Value and Benefits of Game-Based Learning

To progress in using a game is to learn. When learners are actively engaged with a game, individual minds are experiencing the pleasure of grappling with (and coming to understand) a new system or how to use the system. This is true whether the game is considered “entertainment” or otherwise. The greatest advantage of using game-based learning devices, students of multiple abilities could find their own comfort zone while using a particular game. Games could help to expand student learners' literacy (Hagel and Brown, 2005).

2. LITERATURE REVIEW

This study contributes and further communicates how the existing literature related to game-based learning influences student academic achievement. The academic achievement factor must be measured by the quality of information that is evidence-based on state and national standards by the use of an accepted rubric. In order to cite the level of academic achievement using game-based learning devices, a study must be made further to look into a more longitudinal approach about the impact of game-based learning and the academic achievement of students. Perhaps it would be better if more data could be collected and viewed about the academic influence of game-based learning. The whole reason for using game-based learning devices is to enhance student learning and to introduce students to more challenging or difficult concepts and a way to reach students who may be unable to master skills through traditional classroom teaching methods (Barnett and Ceci, 2002).

An annual study carefully crafted would have to be ongoing for three to five years and unpacked to further examine the relationship between gaming and academic achievement of students in the context of educational assessments. If formative assessment instruments were used, these assessments would have to be clearly measureable in order to add to the reliability and viability of the game-based learning devices (Delacruz, 2011).

Students learn differently based on their learning style and personal interests. Students may be motivated to learn more when the learning has real-world application. By the use of technology devices it could cause students to be motivated and stimulated in learning different skills.

2.1. Game-Based Learning Provides Active Learning Strategies

Games methodically provide the learner with new and varied learning environments that meet his or her own learning style. Active learning through the use of gaming has shown a positive impact with learners by allowing them to actively participate in a learning project instead of passively listening to lectures or watching videos with educators assigning games as pre- and post-tests, reviews, and even as homework assignments may motivate the

student learner (Annetta, 2008). When K-12 learners are learning to play games, they are in fact learning a new literacy or language that is defined above and beyond traditional reading and writing, but through multiple interactions including images, text, diagrams, symbols, and movements (Gee, 2007). These multiple interactions need correct interpretations for the learner to master the game resulting in an out of the box thinking and risk taking which are based on active learning. Active learning principles focus on games requiring players to use their time in passive learning and reflective thinking, which generates information from this type of learning through instant feedback and the opportunity to determine additional game solutions (Gee, 2007).

An active learning strategy can be defined as an engaging activity that requires the learner to perform an educational action. The teacher can be sure that each learner has participated in the active learning experience based on evidence of data from the game application tool used in the learning process. Active learning strategies could be individual or group work. The learning strategies should be organized in a constructive manner to ensure effective ways of involving learners in the learning process. Active learning strategies may also include, but not limited to brainstorming activities, peer and self critiques of work and role playing (Miller *et al.*, 2011).

Game-based learning affords students a way to be more engaged with the subject matter and information in classroom disciplines that have real-world application. When students play video games to enhance their learning experiences they are more interactive and stimulating compared to the way instructional services are delivery in a tradition class format by the use of physical paper such as textbook assignments. Students have also had the opportunity to replay and gain proficiency in skills or knowledge mastery of a subject area by using game-based videos or devices (Bogost, 2011).

2.2. Games and Simulations Samples

There are many benefits to games and simulations in learning. Educational games and simulations have been found to be effective in motivating students to learn (Ke, 2008; Papastergiou, 2009; Tuzun *et al.*, 2009) and games that encourage exploration may be particularly engaging to learners, especially girls (Kinzie and Joseph, 2008). An example of a game that fosters exploration is Discover Babylon, in which young learners travel through Mesopotamian time using math, reading and writing skills.

Some games and simulations allow learners to explore and create materials that they could not work directly with in real life. For example, Chemsense provides an environment in which learners can explore chemical processes and see the effects of changes. These open environments can also help learners to correct errors and misconceptions in their thinking by allowing them to test out hypotheses. Simulations can enable learners to develop familiarity with an activity before they engage in it. As an example, with Froguts, learners can use an interactive computer program to proceed fully through a frog dissection before attempting dissection of an actual frog in real-life. Learners who use simulations report that they feel more confident in their skill competence when later working with real materials (Ronen and Eliahu, 2000).

2.3. Value of a Simulated Experience

Using games to teach skills for real-world activities, the learner can make mistakes and improve upon the deficit in a quick turnaround manner. Therefore, the learner making the mistake can go back to improve upon the skills needed. The student learner can also engage in decision-making, by taking a different way to solve the proposed problem in a simulated manner (Brom *et al.*, 2011). The simulated experience can provide the learner with a life-like experience. The simulated experience can also educate the learner too, in workings of many sectors in a whole virtual experience without utilizing the real official environment of action. Again, the simulated object can be used to educate and inform best practices for skill and knowledge development for the learner (Brom *et al.*, 2011).

2.4. Use of Games in the Classroom Environment

If used in an appropriate manner, many types of games could be used in an educational environment that enhances teaching and learning in various disciplines. Games could be used to master specific coursework, reinforce the development of a skill, expand concepts, gaining knowledge of people and their culture and a number of other important informational activities (McGonigal, 2011).

Learning by doing is an approach that makes sense in an educational environment. In classrooms today, student learners have an attitude of wanting to be engaged in their own learning experiences. Students want to have their hands, eyes and minds in the classroom “doing something.” The “doing something” is not a new phenomenon, but reason for being in school (Bourgonjon *et al.*, 2010). By using gaming devices in the classroom, it can help student learners to personalize the way they engage in learning based on their own individual needs. Gaming or digital devices help learners to engage in interactive tasks that may represent real-world experiences. Real-world experiences help students to see the relevance to why they are learning something. Learners will be able to apply and link what they are learning to a realistic situation. Technology today is evolving fast and this is an opportunity to deliver instruction and learning experiences in more ways than one venue by the teacher. If planned carefully, teachers may soon enjoy the many ways that digital games are able to enhance the instructional delivery process. However, another school of thought by critics that digital gaming in the classroom can hinder classroom deep learning in reading for males and females who do not benefit from these experiences on an equitable level. However, the more progressive thinkers believe that digital gaming is a positive tool for educating students and changing their behavior (Bourgonjon *et al.*, 2010).

2.5. Enhancing Learning

More learners today have been exposed to a lot of technology applications; therefore, the natural order of learning could be enhanced by the use of digital games. Using game-based learning through the application of technology provides the learner with lots of hands-on activities. Gaming activities are highly engaging and it helps the learner to find ways of solving problems by various means (Liu *et al.*, 2011). Using different gaming applications, gives the learner also immediate feedback as a key place of reference. A place of reference tells the learner and user of the game that this is a designation of the game. Gaming may also give the learner the opportunity to experience practice for real-world application of skills and knowledge. Learners respond to the gaming learning experience for many of the following reasons because the information is: 1.) what the learner wants to learn. 2.) What the learner sees as a benefit. 3.) What the learner believes it will help him/her to grow. 4.) What the learner sees as relevant, purposeful, meaningful and current. 5.) What the learner sees as different but enjoyable (Kapp, 2012).

The learner wants to learn when information is perceived as being important, timely, valuable, and useful. The learner may wish to be engaged in mastering skills, if the learner sees the skills as being significant. Beyond the world of intentional benefit, the learner's behavior is one of choice. If the learning experience is significant to the learner then the opportunity will be of personal development and engagement. When the learner is in a formal environment such as the classroom, the learner may continue to be directed by the teacher to complete certain tasks as an individual or in a group activity. The group activity could suggest that the teacher is encouraging learners of both genders to participate in learning communities that are driven by tasks. Learners participating in learning communities will gain more skills and knowledge about the importance of sharing knowledge with others in a collaborative manner. When student learners have a positive attitude toward problem solving, students are more willing to commit to learning. However, more research is needed for the cognitive development of students for game-based learning which would measure students' academic growth (Fengfeng, 2008).

2.6. Building Literacy Skills

If the game is well designed, the learner will be able to repeat the experience of mastery over and over again toward perfection. Games could be used to build literacy skills in reading and mathematics, if enjoyed, age appropriate, could create a great feeling of entertainment and well being for the student (Yip and Kwan, 2006). There are many steps involved in reading as one would tell a story in a narrative and a sequential manner according to game theorist (Zimmerman, 2007). These theorists believe too, that the influence of new media and gaming have a place within the narrative of traditional storytelling as an example. The question could be put forward, just how does the learner learn? With certainty, the learner will probably learn more in a comprehensive manner, if the experience is purposeful, meaningful and enjoyable (Gee, 2007).

2.7. Teacher Balancing Learning Engagement

Research evidence suggests that game-based learning helps to keep learners more engaged in their own learning. It is important for the teacher to provide the learner with gaming opportunities as another way of learning a skill and gaining knowledge. Learning should and could be fun; however, the teacher must make sure that the pedagogical approach to learning is clear and meaningful. In essence, the teacher must continue to make the balance between fun and learning quality skills and knowledge that is relevant for all learners is what is important. The teacher should make sure that the academic content for the learner is relevant for problem-solving through facilitation with appropriate guidance, procedures that are followed and keeping the educational environment on target based on coursework expectations and standards (Schaaf, 2012).

Educationally game-based learning could help the teacher to use another path of infusing the instructional delivery process such as making the learning more relevant, active and engaging the learner, giving learners choices and letting learners know that their thoughts are valued, the need to build a community of learners through collaboration, demonstrating that there is an acknowledgement that learners do learn differently and the teacher is willing to make it possible. It is important for the teacher to maintain high expectations for all students and creating and maintaining an environment that is conducive to learning (Miller and Robertson, 2011). There is a strong agreement among most researchers that digital gaming can promote learning, but what is important is "positive learning" that builds needed skills academically that are needed in competitive societies (Shaffer *et al.*, 2005). By allowing the learner to gain new and improved knowledge through different modalities, the teacher is indicating to learners that the teacher believes that learning can take place by various means and ways by the use of game-based learning devices. If learning is meaningful and enjoyable, the learner sees learning as being relevant (Kenny and McDaniel, 2011). Student learners are engaged behaviorally, emotionally and cognitively when students participate in game-based learning that is meaningful and purposeful. Students are able to connect what they are learning that has real-world application. When students' previous knowledge and experiences are welcome in the learning process and environment the teacher is more relatable to students' culture needs (Fredricks *et al.*, 2004). Meaningful learning of engagement positively embraces collaboration, values students thoughts and knowledge, challenges students in a positive manner and welcomes students from all cultures to the learning environment (Zepke and Leach, 2005).

2.8. When is the Learner Motivated?

If schools are learner-centered, then there must be evidence that teachers have provided the opportunity for learners to be engaged in their own learning by exploring, interaction with the physical world and with other people allows student learners to discover concepts and apply skills. The teacher encourages students to reflect upon their discoveries, which is essential for the student cognitively. Using game-based learning devices, students become teachers themselves and are able to model their acquired skills to their peers. Game-based learning experiences provide students with knowledge of information integration. When learners are bored, the chances are

that these learners are not engaged in the learning process that meets their individual needs and interests. Learning is a responsive nature of acquired skills and knowledge. This opportunity for learners is needed for the learners to see and believe that “whatever is to be learned has relevancy” to the learner’s life and this is motivational to the student learner (Ames, 1992). In the classroom or an outside classroom assignment, the learner needs interactive and meaningful experiences. When the learner can see what is being learned and can be connected or linked to the real-world, the learner is generally motivated, because what is being learned has a real purpose. Students who are motivated pay attention more in class, want to be in class, like to be given choices, find activities to be enjoyable and students are better behaved (Ambrose, 2013).

2.9. Linking and Connecting the Learning Experience to Relevancy

According to Gee (2005) there is some value added to game-based learning when the experience is linked to how the learner learns in the context of the game environment educationally. If the learning experience to the learner is connected to: 1.) Applicable job performance. 2.) Relevant to the learning objective. 3.) An encouraging way to be active and critical in the learning process 4.) Exploring the world by doing something meaningful. 5.) Acting and experiencing real-world foci. 6.) Specific goals in a variable game setting. 7.) Activities that are interesting and critical in the gaming experience. 8.) Non-passive, learning but interactive learning. 9.) Making choices through experimentation that are mature and meaningful. 10.) Seeing performance evaluations as a way to improve learner outcomes. This is when relevancy stands the "test of time."

2.10. Solving Problems for Real-World Application

Game-based learning today is used in a variety of organizations to training individuals how to solve real-life problems that are commonly found in emergency respondents, military operations, and medical activities just to name a few situations. Therefore, the impact of game-based learning even for adults could have a broad-based meaning to the learner and for the future as new games are designed for forward thinking users (Klopfer *et al.*, 2009). By going through a gaming exercise, the learner may gain an experience of realism “what it could be, but not an absolute in the real-world.” The gaming constructive experience could give the learner eventually a way to see platform of how readiness looks like through the gaming lenses. The learner will have a stronger idea as to the kinds of skills and knowledge that one would need to solve problems. The learner will further learn the processes in detail how things are done and why. The learner will master skills related to certain jobs and the use of tools applicable to certain jobs in education, health, and the military (Vos *et al.*, 2011).

3. METHODOLOGY

This study used qualitative information about game-based learning by looking at gamification in the educational environment that addresses the game-design principles to help change the instructional setting by the teacher in order to offer the student learner more fun relevant activities which engages and motivates the learner. Some of the principles are at the level of learning, challenges and the mastery of skills observed, assessment of points, and immediate feedback to the learner (Kapp, 2012).

Using the simulation approach to learning, games stimulate the learner because the learning yields greater comprehension, application, analysis, synthesis and assessment. The major methodology behind game-based learning does not deploy the assessment of the learner's ability totally, but it teaches the learner how to apply and use theory of real-life situations which has more meaning to the learner especially in the area of problem solving in group settings or the individual playing of games. By using game-based learning, learners will be able to relate to what they have learned in an applicable manner (Rieber *et al.*, 2004).

Learners today are able to use a traditional approach in theory in game-based learning. However, using the traditional theory in game-based learning, learners read texts, take notes and answer questions is not frequently

desirable. This method is not the most exciting way to learn based on input from learners who are technologically savvy. The traditional approach does not always afford learners the linkage between their learning and real-world application ([Theory and Research-Based Principles of Learning, 2013](#)).

In the world of teaching by delivering instructional services at all educational levels, faculty or teachers could have a stronger impact on learners' acquisition of knowledge by incorporating game-based learning experiences for learners. The attention level of learners may be a challenge sometimes. Qualitative data suggest that game-based learning methodology could impact learner's interests in learning a subject and could be a motivator for keeping the learner engaging and focusing on learning relevant materials that have real-world application ([Baxter and Jack, 2008](#)). Data further suggest that game-based learning may influence teachers to re-assess the way in which they teach. It is essential that learners' attention and enthusiasm be a big part of ensuring learners' success by teacher's planning and implementing instructional delivery services that are appropriate for each student. Game-based methodology has the potential to transform classroom settings into environments that promote effective and purposeful learning for all student learners ([Silvia, 2012](#)).

3.1. Research Question and Implications

The overarching research question in this study is: does game-based learning actively engage learners in their own learning? The answer to this question is yes which is further communicated in the overall findings for this study. While learning, learners are playing games and this makes it an easy sell for the teacher or faculty member to keep the learner's interest both in and out of the classroom. Therefore, more learners are motivated and engaged in their own learning. Game-based learning encourages self-reliance and self-determination in reference to the learner's ability to continue engaging in the mastery of the game in various settings. The level of engagement and interaction with games expands the competition and rewards the gaming experience plus the learning experience goes far beyond the classroom when using game-based learning experiences for students ([Arnseth, 2006](#)).

Research findings further suggests that by learners participating in game-based learning, learners are motivated and are engaged more in their own learning experiences in different discipline. How is this information measured? Several studies have measured such outcomes by incorporating learner observations and time-on-task. The essence of time-on-task is an indicator of the learner's engagement or time spent on a task ([Fengfeng, 2008](#); [Annetta et al., 2009](#)).

Other findings on game-based learning can have many benefits, but how gaming is impacting teaching and learning has not been fully determined quantitatively. Therefore, more research needs to be done. Game-based learning can be used to transform the way learners master educational skills and knowledge in a variety of ways ([Annetta et al., 2009](#)). Learners can be exposed to a different structure of educational instruction and lessons for learning a particular skill. Through game-based learning the learner's performance could be monitored and evaluated to determine the degree of mastery in a quick manner ([Markovic et al., 2007](#)).

Another body of research findings suggest that learners learn more when they are involved in their own learning over a period of time. Gaming, if enjoyed, helps to set the stage for learning for the learner. Using a video model for learning as an example, the learner could be exposed to units of instruction in a personalized manner. When learners engage in their own learning, they have the capacity to participate in their own learning experiences and style without waiting on the teacher to give them every step of the way. The learner can also seek higher expectations as being self-directed in the learning process ([Salen, 2008](#)).

3.2. Overall Findings

Several qualitative studies suggests the following about game-based learning engagement and motivation. 1). Learners are motivated, because of the praise, encouragement and reinforcement, confidence and are motivated to continue the task ([Ya-Ting, 2012](#)). Games expand learner's curiosity and are enjoyable ([Papastergiou, 2009](#))

3). Teachers say that when learners play the game, students want to learn more and pay more attention, because the learner likes to pass the game missions (Kebritchi *et al.*, 2010). Learners who learn through using video games appear to show a link between the observed increased in both the level of the challenge posed by the task (Liu *et al.*, 2011). 5). The feeling of being positive psychologically is felt by the learner (Csikszentmihályi, 1996).

3.3. Impact of Video-Games

The literature on game-based learning has various views about to what extent that video game devices can impact overall on student achievement academically. It appears that video game-based learning does positively impact problem-solving skills and knowledge. Research does strongly suggest that game-based learning using video games influence how students are motivated regarding their own learning (Barab *et al.*, 2009). Most teachers believe too, that video-games, as an interactive learning tool, have a positive place in student learning. It is safe to say that there should be more data analysis in order to be able to see a broader point of view to what extent do videos impact learning. Teachers are generally positive in suggesting that video games are useful in the classroom. However, many teachers do not believe that there is enough data to determine the actual impact in reference to the use of video games to the academic achievement of students (Gee, 2007).

In summary, findings seem to suggest that when students are motivated they learn more from the subject area. When students are motivated their skill mastery is greater. Game-based learning promotes a positive attitude in problem-solving individually and collaboratively and could build social networks plus build positive relationship with others (Choi *et al.*, 2012). Students are also willing to work together on various projects when using game-based devices (Fengfeng, 2008). It is a strong belief that there is a correlation between a student's attitude individually and collaboratively to learning and the actual learning outcome (Vogel *et al.*, 2006).

3.4. Game-Based Learning can be Scholarly Significant

Game-based learning is scholarly significant because it allows diverse learners to be able to: 1.) Receive customized learning experiences to fit the learner's ability and interests. 2.) Engage in interactive tasks that could simulate real-world experiences. 3.) Improve brain functions, while others may reverse the loss associated with aging. 4.) Encourage decision-making that could drive progress. 5.) Expand the teaching capacity of literacy skills across disciplines. 6.) Expose to mastering new languages, build vocabulary and participate in multi-tasking opportunities. 7.) Access information pertaining to current issues on law and educational policy. 8.) Provide the opportunities to connect in "real-time" with global communities. 9.) Participate in the evaluation process of tasks performed in various classes. 10.) Use research that supports the positive value and benefits of game-based learning in solving-problems and other related activities in the classroom or clinical settings that will impact the future use of games to promote learning in educational environments and many other settings (Shaffer *et al.*, 2005).

3.5. Future Recommendations

This paper contributed to student motivation and actively engagement in using game-based devices in their own learning. However, a broader scope of research may be used in the future to quantify how game-based learning may influence student academic achievement by using a quantitative measured approach. This could take place for learning by using a number of questions that are cited and could be analyzed based on the effects and use of game-based learning devices and student achievement academically by future researchers. Again, to learn more about the effectiveness of game-based learning beyond motivation and engagement, future researchers may wish to look at stronger results for students' acquired skills and knowledge academically through structured tested assessments (McDonald and Hannafin, 2003). Perhaps the following questions may assist in these efforts. 1). What type and how much research is available to validate the academic outcomes on student learning using game-based devices? 2). What are the best practices in using evidence-centered design tools to create new game-based learning

assessments for different disciplines or courses? 3). What appropriate rubrics are available to assess the use of game-based tools? 4). What game-based measures can be used to show specific academic learning outcomes based on standards for student learning? 5). What would be the best way to harness the power of game-based learning experiences for students on a broad scale in a school environment (Squire and Jenkins, 2003). Using a quantitative approach to a future study, another question needs to be answered that says, does digital game-based learning improve student time-on-task behavior and engagement in comparison to other instructional strategies (Schaaf, 2012)?

How game-based learning devices will be evaluated for their effectiveness in the future will be an ongoing discussion. However, the researchers of this study believe that simulated game-based learning devices, in the future, will be commonly used in various trainings and learning environments in the public and private sector (Aldrich, 2003).

4. CONCLUSION

Game-based learning using digital tools is another way to facilitate the instructional process for the young and adult learners. Learners have the opportunity to be directly involved in their own learning in a variety of modalities. Game-based learning affords the learner the chance to virtually participate in a simulated environment that depicts some aspects of real-life experiences. Learning by using games offers learners to be engaged in the learners' own learning based on their individual needs. Learners normally enjoy and find game-based learning to be fun and challenging sometimes. When learners have fun learning, they are more motivated to learn new and challenging tasks. Game-based learning promotes and encourages the learner to learn in and outside the classroom (Backlund and Hendrix, 2013). Game-based learning allows the learner to focus on repeating the task until desired results are met. The learner also has control over his or her own learning experiences through exploratory actions. The 21st Century classrooms and outside the classroom affords the learner many options to learn a new skill or gain new or improved knowledge. Many learners are able to successfully participate in multiple learning activities within a short period of time by using digital games; therefore, there are many advantages to the game-based learning experience (Prensky, 2003).

The digital generational learners find that game-based learning is a natural way of obtaining objectives to meet current educational or organizational standards. The digital generation of learners using game-based learning is highly engaging and is fun and motivational (Prensky, 2002). Today's learners enjoy teamwork and are competitive using game-based learning. Plus instead of waiting a long time for feedback from the teacher or trainer, the learner can receive immediate feedback after completing a task digitally. Beyond games being fun, motivational, and engaging, the game-based learning experiences for learners with the guidance of the teacher or trainer can be personalized to meet the learner's individual needs. By involving learners in their own learning, the learner becomes the master of his/her skills, knowledge and personal development (Shaffer *et al.*, 2005).

The overall advantages, in summary, to game-based learning are as follows: cost –effective because of access, instructionally-driven, low physical risk and liability, standardization is specific, highly engaging in the learning process, learning is personalized, interactive with others and is possible that activities can be assessed and the overall experience for learners to transfer sample actions to real-world application (Trybus, 2014). Finally, by involving learners in their own learning, the learner becomes the chief facilitator of their own knowledge and skills gained. By manipulating a game successfully when conducting an educational task, the learner can be reflective of the learning experience and will also have a better feeling about self (Fling *et al.*, 1992).

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