2017

Literature Review (Overview)

MAKING EFFECTIVE YET FUN EDUCATIONAL DIGITAL GAMES THAT WILL HELP SECONDARY SCHOOL STUDENTS OR OTHER STUDENTS AGED FROM 11 TO 18 IN LEARNING KEY SKILLS THROUGH THE USE OF TECHNOLOGY.

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Research Question

The main purpose of this study is to make effective yet fun educational digital games that will help secondary school students or other students aged from 11 to 18 in learning key skills through the use of technology.

Introduction

In order to understand better, by key skills I am referring to Maltese, English, Math's, and Science subjects that are thought in Maltese education.

From research that I already done people in general are trying to gamify tasks that are tedious to do, but not everyone understands the true meaning of gamification.

Converting a textbook into digital version is not gamification (Radoff, 2012) nor putting traditional educational methods into a game is.

Therefore, I will conduct several studies to learn if is it possible to achieve this ambition and if yes, what is the best approach.

Digital Technology and Games

In this section I will address why we should use digital games instead of traditional games in order to improve learning and engaging students to these learning games.

Technology

After reading several articles and journals all start with a particular statement, Secure Networks (2016), Hatch, Kristina E. in *Determining the Effects of Technology on Children* (2011) and Kevin C. Costley in *The Positive Effects of Technology on Teaching and Student Learning* (2014) say that technology today has become part of our lives: at home, at work or even in any other place. The use itself will prepare children for future life and jobs and that nowadays children are very attracted to technology so it will help to keep students more focused to the lesson.

"Others argue that children using technology are becoming socially stunted, ungrateful, and ridden with health-related issues" (Hatch, 2011).

A survey on media use, conducted by The Kaiser Family Foundation in 2010 cited in (Hatch, 2011, pp. 3-4), states that a group of eight to eighteen years old spends on average of ten hours and forty-five minutes per day exposed to media.

To be able to start working on the research question it would be wise to explore some pros and cons of technology impacting our lives and that of our children, since introducing an engaging game to school and accessible also at other places might increase the hours spent on technology. Although it might also remain the same since hours spent on the game might also result in less hours spent on another technological medium such as television.

Pros

Technology brings many benefits to users not only from game aspects but also as accessibility and training.

- Compact and Easily updated
- Improved Vision
- Renovating the Class
- Socialisation
- Exercising with Games (ExerGaming)

Cons

- Loss of privacy
- Degrading Multitasking
- Health Related Issues
- Changing Social Norms

At this point in time, as these studies suggest, we can have great benefits but also great risks from using technology at a young age for a prolonged time day after another. It is very hard to state whether it is good or bad, and this might all change soon again since technology will keep on changing and evolving. Another aspect is that today's generation of children which have been exposed to technology for a long time have still not developed into adults so these studies may not be conclusive yet (Hatch, 2011).

"We have completely changed the way children play. We are in the midst of a large, uncontrolled experiment on children, the effects of which we won't know for years" as Dimitri Christaski, the director of the Child Health Institute at the University of Washington, cited in (Hatch, 2011, p. 31).

Hatch (2011) suggests that to allow children gain the benefits of technology while keeping away the hazards that come along with, is to moderate and parental control as many of the physical risks arise from overuse and abuse their technology of choice.

Games and Education

One benefit of games in education is that they encourage active learning. Active learning is a way of making learning authentic and it encourage students to participate in the lesson trough discovery, processing and applying new information as defined by Van De Bogart (2009) cited in (Milczynski, 2010).

But what does make games so engaging? According to MacKenty (2006) as cited in (Milczynski, 2010) "it's the act of problem solving that makes games so engaging… devoid of challenge or risk of failure, games really aren't all that much fun".

In addition, MacKenty (2006) and Harris (2009) as cited in (Milczynski, 2010) both agree that if an educational game is well designed, students can build their problem-solving skills while having fun no matter the genre of the game.

In order to have a successful engaging educational game one must create a game suitable for students to be fun by challenging them. This subject will be further explored in the next chapter *Targeting Specific Audience with the Right Methods.*

An interesting question I came across while reading Milczynski (2010) literature review is of Rotter (2004) where he asks, “If a pupil didn’t already study and learn the information, is there any way to get the answer during the game?”.

This is e very intersting question and fluded my mind with different ideas. Where the game would be in such a way that the player can choose his own difficulty like in Dark Souls Two mad by Bandai Namco (2017). In Dark Souls II the player is able to chose the dificulty from the wepon chosen and in the education game, there might be portals which puts the player to the test to access a certain dificulty while if you did not reach that level yet you can go to a lower level to learn the needed skills.

Targeting Specific Audience with the Right Methods

Bartle’s Taxonomy of Player Types

Bartle’s Taxonomy of Player Types is the study of the way a player acts or interacts with the world or with other players in a MUD game which later was adapted to MMORPG’s. It is important to keep in mind that this experiment was for players interacting in a virtual world for fun. There could be other players that do not play for fun and instead people can play the game as a job like: if you are a game designer, journalist, researcher and or gold farmer (CasualConnect, 2012).

Player Types:

- Achievers
- Explorers
- Socialisers
- Killers

Lazzaro’s 4 Keys to Fun

Lazzaro’s refers to emotions in order to address and attract players and that interaction design has access to emotions. The studies are not based on a single game but on a huge variety of games of different genre. She observed a lot of players playing games and noticed that while playing people experienced a lot of emotions and it was driving them to be engaged with the game, because in reality, players where just pressing a button. Games offer: Novelty, challenge, friendship and meaning; These are what players do to create these immerging experiences (AIGAdesign, 2016).

4 Keys to Fun:

- Easy Fun
- Hard Fun
- People Fun
- Serious Fun (Altered States)

Jon Radoff

Jon Radoff (2012) talks about *Game Play Motivation* as what makes a player interested in a game.

Radoff (2012) says that You have to understand much more than conditioning to build a relationship of the player towards a game. He explains how Skinner made his early experiments based on pigeons and later on rats, but humans are much more different from that because we come from a different eco system.

Bartle's taxonomy is being and had been used even where it does not apply which Bartle himself agrees with, therefore Radoff (2012) has rethought the player types into motivations.

Player types:

- Achievement
- Immersion
- Cooperation Competition

From these studies, I learned a lot on how one should approach in game design in order to engage a specific set of audience. To full fill what I want to achieve, it is important that the game is interesting and engaging to every student. You cannot risk in leaving someone behind. Therefore, this study on different personalities and player types while playing will help me out in carrying such task based on studies and theories which are proven to work.

Currently Existing Educational Technologies

Teaching and Learning Technologies

There are several technologies that one can use in class as mentioned by Bevin Kateri (2017) a teacher and writer from Virginia, but in the list below I filtered those who fit best in teaching students from 11 – 18 years.

A brief list of today's educational Technologies that can be used in class are:

- Interactive websites
- Apps
- Educational Video Sites
- Online Organisation
- Interactive Whiteboards
- Online behaviour System

As it is true that these technologies and methods exist and work, from my own experience as a student I never encountered such thing during a lesson apart from interactive whiteboard and projectors which is not mentioned in the list. So, one of the main problems that we might have here in Malta, could be: that such tools are not being provided to teachers, teachers could not be trained on how to use such technology, technology is too expensive for the budget of the school.

Teaching Methods Employed in Key Skills

According to research and discussing with teachers and lecturers, methods of teaching today are Student centred. This is a broad subject and can be explored in depth but here I am going to just scratch the surface so that I am able to understand what is this type of method used and why it is used. Keeping this information in mind will probably help me designed a better educational game, but without falling into the trap of false gamification mentioned in the introduction.

A brief summarisation by Lea et al as cited in (O'Neill & McMahon, 2005, p. 28):

- "the reliance on active rather than passive learning,
- an emphasis on deep learning and understanding,
- increased responsibility and accountability on the part of the student,
- an increased sense of autonomy in the learner
- an interdependence between teacher and learner,
- mutual respect within the learner teacher relationship,
- and a reflexive approach to the teaching and learning process on the part of both teacher and learner."

Further exploration of each individual subject will be needed in order to understand how teachers handle and manage to teach step by step, starting from the very basic, their subject since it is what the game will be doing alongside with the teachers lectures.

Conclusion

After exploring different subjects I now have a better understanding of how I can conduct further experimentation and studies on games in education while keeping students privacy but connected to their friends, play in cooperation to help and encourage one another, experiment and consider existing technology that are used in Maltese classroom (although highly unlikely since the game will not be portable and that will lose all the scope of this research) and explore more in depth traditional teaching methods as to make the game easier in learning the subject at hand. The game could also be customisable for the teacher in order to make it more suitable for their lesson or a dedicated game will be created for specific subjects.

Bibliography

AIGAdesign, 2016. *Nicole Lazzaro | Games and the Four Keys to Fun: Using Emotions to Create Engaging Design.* [Online]
Available at: https://www.youtube.com/watch?v=EEmNRRRqgNc
[Accessed 11 December 2016].

Bandai Namco, 2017. *Dark Souls II.* [Online]
Available at: http://www.darksoulsii.com/us/
[Accessed 18 January 2017].

Bartle, R., 2016. *Richard A. Bartle: Players Who Suit MUDs.* [Online]
Available at: http://mud.co.uk/richard/hcds.htm
[Accessed 14 December 2016].

CasualConnect, 2012. *Player Type Theory: Uses and Abuses | Richard BARTLE.* [Online]
Available at: https://www.youtube.com/watch?v=ZIzLbE-93nc
[Accessed 9 December 2016].

Class Dojo, 2017. *Class Dojo.* [Online]
Available at: https://www.classdojo.com/en-gb/?redirect=true
[Accessed 18 January 2017].

Costley, K. C., 2014. *The Positive Effects of Technology on Teaching and Student Learning.* [Online]
Available at: http://files.eric.ed.gov/fulltext/ED554557.pdf
[Accessed 18 January 2017].

Csikszentmihalyi, M., 2004. *Flow, the secret to happiness.* [Online]
Available at: https://www.ted.com/talks/mihaly_csikszentmihalyi_on_flow#t-69654
[Accessed 16 December 2016].

Discovery Education, 2017. *Discovery Education.* [Online]
Available at: http://www.discoveryeducation.com/
[Accessed 18 January 2017].

Froyd, J. & Simpson, N., 2008. *Student-Centered Learning Addressing Faculty Questions about Student-centered Learning.* [Online]
Available at: http://petersj.people.cofc.edu/CCLI/PDF/Student_Centered_Learning-FacultyQuestions.pdf
[Accessed 18 January 2017].

Handwerk, B., 2009. *Video Games Improve Vision, Study Says.* [Online]
Available at: http://news.nationalgeographic.com/news/2009/03/090329-video-game-vision.html
[Accessed 18 January 2017].

Hatch, K. E., 2011. *Determining the Effects of Technology on Children.* [Online]
Available at: http://digitalcommons.uri.edu/srhonorsprog/260
[Accessed 18 January 2017].

Kahoot, 2017. *Get Kahoot.* [Online]
Available at: https://getkahoot.com/
[Accessed 18 January 2017].

Kateri, B., 2017. *ECE Technology: 10 Trending Tools for Teachers.* [Online]
Available at: http://www.earlychildhoodteacher.org/blog/ece-technology-10-trending-tools-for-teachers/
[Accessed 18 January 2017].

Lazzaro, N., 2004. *Why We Play Games: Four Keys to More Emotion Without Story.* Oakland, CA 94618: XEODesign.

Milczynski, K. A., 2010. *Literature Review: Effectiveness of Gaming in the Classroom.* [Online]
Available at: https://msu.edu/~milczyn1/artifacts/LITERATUREREVIEW_KAREN_MILCZYNSKI.pdf
[Accessed 18 January 2017].

O'Neill, G. & McMahon, T., 2005. *STUDENT–CENTRED LEARNING: WHAT DOES IT MEAN FOR STUDENTS AND LECTURERS?.* [Online]
Available at: http://www.jfn.ac.lk/OBESCL/MOHE/SCL-articles/Academic-articles/14.SCL-2.pdf
[Accessed 18 January 2017].

Radoff, J., 2012. *GSummit NYC 2011: Jon Radoff - Designing for User Motivation.* [Online]
Available at: https://www.youtube.com/watch?v=I79icpye_PQ
[Accessed 16 December 2016].

Secure Networks, 2016. *10 Reasons Today's Students NEED Technology in the Classroom.* [Online]
Available at: http://www.securedgenetworks.com/blog/10-Reasons-Today-s-Students-NEED-Technology-in-the-Classroom
[Accessed 24 November 2016].

Symbaloo, 2017. *Symbaloo.* [Online]
Available at: http://www.symbaloo.com/home/mix/13eOcMZU9A
[Accessed 18 January 2017].