Designing for Learning and Play - The Smiley Model as a Framework

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INTRODUCTION

When seeking to create ideal learning environments for students and teachers, it can be a challenge to find a balance between facilitating learning processes at high levels of cognitive complexity [1] and creating playful and engaging experiences for students and teachers [2]. This challenge is relevant to the professional creation of small digital learning games as well as the big Game [3], that is, the learning and play situations that exist surrounding the use of small learning games, when students discuss, negotiate, develop, and decide what to do next inside the learning games. The desired balance is lost if the learning processes become shallow – at a low level of cognitive complexity – though it may be great fun [4]. Conversely, a game may facilitate good learning processes and many learning activities but result in low motivation among students because it is considered boring.

The difficulty in aligning learning situations with playful situations can be viewed as the typical difference in focus points between learning designers and game designers [5]. For learning designers, learning goals and learning processes are very important and are given a high priority. For game designers, learning goals may become secondary to the gameplay itself – game designers traditionally prioritize engaging gameplay [6, 7]. This represents two systems with different aims – learning and play. However, it is well-known that play and learning are deeply interconnected [8]. As game designer Raph Koster stated, "Fun in games arises out of mastery, it arises out of comprehension. It is the act of solving puzzles that makes games fun. With games, learning is the drug." [9, p. 40]. The research question that we investigated was whether it is possible to create frameworks that intertwine learning and play in a meaningful and successful way. Furthermore, we wished to determine whether it is possible to implement these frameworks in learning situations in a way that creates meaningful and cognitive complex learning processes.

This paper gives a brief description of a framework for designing engaging learning games. This overview is followed by an outline describing how this framework was used to build a Design-Based Research (DBR) project focused on teaching adult students through their design of curriculum-based digital learning games [10]. The students included in this study were engaged in the pursued of a full-time upper secondary general education at VUC Storstrøm, an adult education centre in Denmark.

Keywords: Learning game design, playful education, game design model, students as learning game designers.

1. The Smiley Model

The Smiley Model (Figure 1) is a learning game design model for building engaging learning games [11]. The model combines learning design and game design – or learning and play. It is a theoretical model that addresses how to design learning processes and implement learning elements into a game, while also considering how to make the game motivating and engaging.

The Smiley Model uses a framework for learning design [12] that encompasses designing for the students' learning prerequisites, the setting or learning situation, the learning goals, the content, and the creation of relevant learning processes and evaluation processes. The framework is accompanied by six game elements that are used to set the learning design into play: game goals, action space or narrative, rules, choices, challenges, and feedback. Each of these game elements are intertwined.
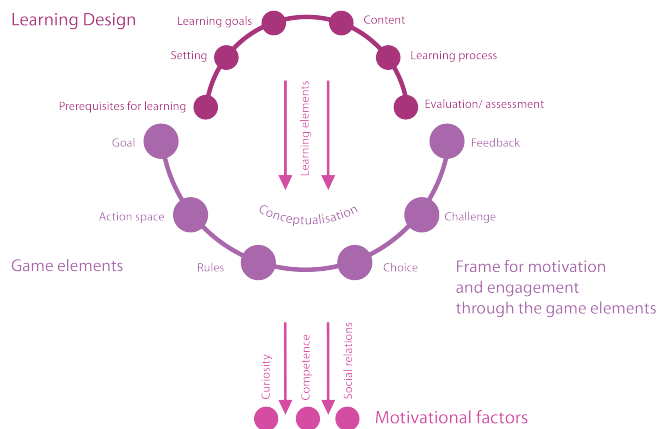

Figure 1: The Smiley Model [11]

The Smiley Model thus addresses the need to design the learning process, to set the learning elements into play through traditional game-elements, and the need to design for motivational factors. These needs align with the three primary driving forces for our intrinsic motivation to learn [13]: 1) curiosity 2) the feeling of achieving competence and 3) reciprocity.

2. The research project

This research project is the third iteration of an on-going experiment [4, 10, 14]. The investigation was conducted as a mixed method Design-Based Research (DBR) study, in which the teachers and students were important co-designers during the development and test processes. In this project, *student-game-*

designers were learning inside a big Game while designing small digital games. The Smiley Model inspired and provided a scaffold for the overall big Game – the gamified learning design as well as the students' learning game design process, during which they implemented learning goals from curriculum into the small digital games. Figure 2 outlines how the learning design was structured.
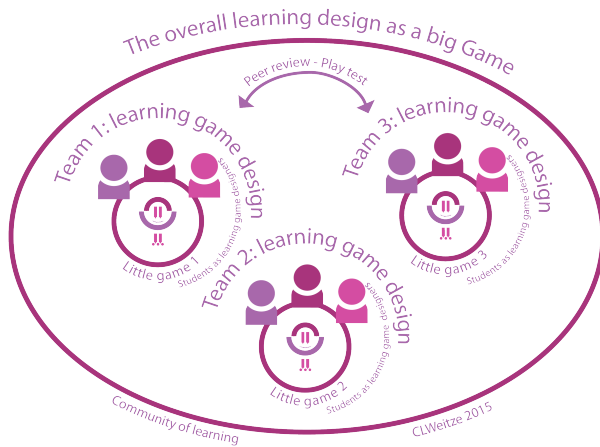

Figure 2: The gamified learning design.

The students formed teams that competed and collaborated, implementing learning goals from history and English as a second language (ESL). This process occurred during three five-hour workshops. There were 25 levels of assignments presented to the teams in Google documents. The aim of the learning project was that the students would discuss, negotiate, and finally master the intended learning goals while building and implementing these goals into the small games. In the assignments in the big Game, the students were guided through a paper prototype phase followed by a software development phase as they ideated and conceptualized and developed their small learning games (Figure 3).

3. A learning and game design framework – what are the affordances?

Because designing learning games is a complex process, even for experienced learning games designers [15], the Smiley Model was used to scaffold and support students and teachers during the learning design and game design process. The concepts from the model were used to formulate questions about learning goals, learning processes, learning activities, etc. The student teams answered questions and solved tasks regarding the creation of playful experiences for their fellow students in the small games by producing game goals, narratives, rules, choices, challenges, and feedback. They also focused on ways to spark curiosity, feelings of achieving competence, and a desire to motivate and engage fellow students.
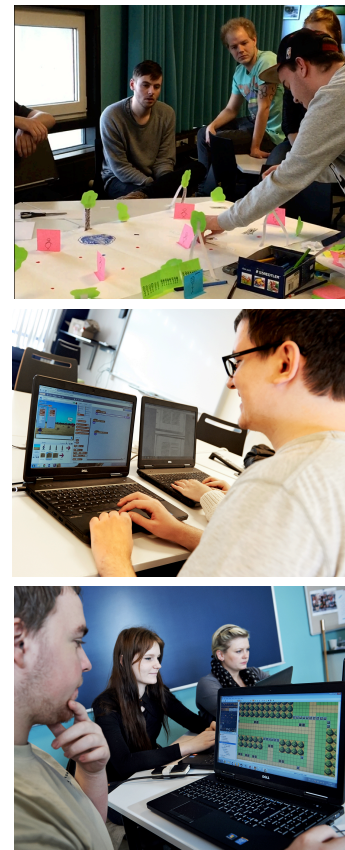

Figure 3: Students designing learning game concepts and digital learning games

One of the lessons learned through the three iterations has led to the development of simple learning game examples that can be used to help students imagine how concepts from the Smiley Model can be materialized. Even concepts like learning goals and learning processes became complex tasks for the students. However, many challenges were overcome by making a very simple example learning game in the programming environment Scratch [16], discussing learning design concepts with the students, and using a mind map showing the learning design choices (Figure 4). Both teachers and students were novice learning game designers. Therefore, the choice, the usability, and the affordances of the game design software were of importance. Through the iterations, it became clear that different software supported implementation of the game elements from the Smiley Model to greater and lesser extents. For example, RGB-maker [17] made it easy to create different narratives, rules, and choices in the games. Scratch was considered an easier platform for novices; the program is available online and has built-in instructions and easy options for sharing with peers, making collaborative learning possible. However, Scratch left the construction of game-elements from the Smiley Model to the imagination of novice game designers, hence the need for simple learning game examples.
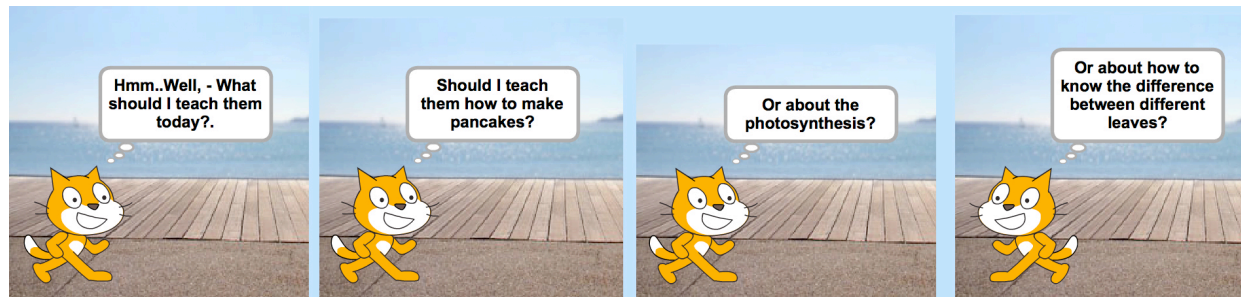
Figure 4: Clips from the simple learning game example in Scratch, discussing learning goals

3.1 A learning game design framework – Does it result in effective learning?

During the third iteration of this DBR project, the teachers claimed that students learned at least the same or more compared to a traditional learning situation [10]. During their assignments, the students first worked hard to create prototype paper games, followed by digital games. The teachers both observed individual cognitive learning processes and collaborative learning processes in the teams, and they also had formative evaluative discussions with the students. The teachers supported students throughout the learning design processes by suggesting ways to implement learning goals into the games. Teachers also used concepts from the Smiley model to guide the students' game development. The students were challenged to create games beyond the "quiz level" through discussions about creating cause and effect situations and by providing multiple learning paths to choose between in the games. This process contributed to cognitive complex learning experiences for the students.

3.2 A learning game design framework – Does it result in increased engagement?

According to the teachers involved in this project, one of the valuable results of this project was a better social climate among the students. Students were observed to work in close collaboration and appear to have more fun than during previous lessons. The students participated as players in the big Game, team against team, but they also experimented with and discussed/peer reviewed the other teams' games. These playful situations were supported by the Smiley Model [4, 10, 14].

3.3 A learning game design framework – Next steps?

In conclusion, the Smiley Model has been useful to scaffold the learning game design process as well as the overall gamified learning design in this research project. However, it is only a model, and when a model is implemented it will be used in a specific learning context, with specific learning goals, actors, and materials – a complex setting. The use of concepts from the Smiley Model has been a success in the current learning situation, aiming at combining learning and play in a meaningful and successful way, enabling complex cognitive learning processes. According to the teachers, this method is a valid alternative to more traditional teaching methods.

The next step in this research process will be a closer analysis of the successful learning environment inside the small games, to gain knowledge about how successful learning game processes can be supported. This will also encompass creation and experimentation with new learning game examples in Scratch in different categories as suggested by Natalie Rusk, lead developer at Scratch, Lifelong Kindergarten, MIT (Personal communication, July 2, 2015). The categories are: 1) mixable, to use the game example directly and mix into a more personal learning game; 2) technical concepts that demonstrate specific relevant features for learning games; and 3) inspirational examples that are deeply complex to imitate but can provide examples of what is actually possible in Scratch. Assignments in the big game is another area that requires further refinement and development. This refinement of the big Game is also relevant when testing the process for different age groups. This learning design concept has primarily been tested with adults, but there have also been successful smaller experiments with 2nd, 3rd, 4th and 7th grade schoolchildren.

Based on previous research [4, 10, 14, 18], a gamified learning design is a complex process and there are still many things to learn before this framework and learning design will be ready to pass on to novice learning game designers outside of this research project. However, the learning process will be fun as we continue to follow this path.

4. ACKNOWLEDGEMENT

5. REFERENCES

[1] Anderson, L.W. & Krathwohl, D.R. (Eds.) (2001) A Taxonomy for Learning, Teaching and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives: Complete Edition, Longman, New York.

[2] Ferrara, J. (2012) Playful Design, Rosenfeld Media, Brooklyn, New York..

[3] Gee, J.P. (2011) "Reflections on Empirical Evidence on Games and Learning", in Tobias, S. and Fletcher, J.D.: Computer Games and Instruction, IAP Inc.

[4] Weitze, C. L. (2014b) "An Experiment on How Adult Students Can Learn by Designing Engaging Learning Games", Meaningful Play 2014: Conference Proceedings, University of Michigan Press.

[5] Weitze, C. L. (2014a) Developing Goals and Objectives for Gameplay and Learning. In Learning, Education and Games: Volume One: Curricular and Design Considerations. Ed. Karen Schrier. Vol. 1, Carnegie Mellon University ETC Press, 2014. p. 225–249.

[6] Hirumi, A., Appelman, B., Rieber, L., & Eck, R.V. (2010) Preparing Instructional Designers for Game-Based Learning: Part 1, in TechTrends. May/June 2010, Vol. 54, Number 3.

[7] Iuppa, N. & Borst, T. (2010) End-to-End Game Development, Creating Independent Serious Games and Simulations from Start to Finish, Elsevier, Focal Press.

[8] Koster, R. (2012) A Theory of Fun 10 Years Later, [online], http://www.raphkoster.com/gaming/gdco12/Koster_Raph_Theory_Fun_10.pdf

[9] Koster, R. (2005) A Theory of Fun for Game Design, Paraglyph Press, Scottsdale, Arizona.

[10] Weitze, C. L. (2015) "Students Learning when Designing Digital Learning Games based on Cross-Curricular Learning Goals", Proceedings of the 9th European Conference on Games Based Learning. Nord-Trondelag University College, Steinkjer, Norway, 8–9 October 2015.

[11] Weitze, C.L. & Ørngreen, R. (2012) "Concept Model for Designing Engaging and Motivating Games for Learning: The Smiley-model", [online], Electronic Proceedings in Meaningful Play Conference 2012, MSU, http://meaningfulplay.msu.edu/proceedings2012/mp2012submission148.pdf (retrieved on 15.06.15).

[12] Hiim, H. & Hippe, E. (1997). Læring gennem oplevelse, forståelse og handling, Gyldendals uddannelse.

[13] Bruner, J.S. (1966) Toward a Theory of Instruction, Harvard University Press.

[14] Weitze, C. L. (2014c) "Experimenting on How to Create a Sustainable Gamified Learning Design That Supports Adult Students When Learning Through Designing Learning Games", Proceedings of the 8th European Conference on Games Based Learning, Berlin, Germany, 9–10 October, 2014. Vol. 2 ACPIL, p. 594–603.

[15] Flanagan, M., Hash, C., & Isbister, K. (2010) Designing Games for Learning: Insights from Conversations with Designers, CHI 2010, Atlanta, Georgia, USA.

[16] Scratch, 2015: https://scratch.mit.edu

[17] RGB Maker, 2015: http://www.rpgmakerweb.com

[18] Weitze, C. L. (2016) The Teachers Role in a Gamified Learning Design where the Students are Creating Curriculum Based Digital Learning Games, NordGold, ILD-Lab – Nordic anthology, waiting acceptance