HOW GAMIFICATION CAN CHANGE PEOPLE’S BEHAVIOR –
DESIGN AND EXAMPLES FROM A CREATIVE GAMIFICATION
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Abstract

This presentation will show the design and student examples from a Gamification course that is taught
to second year IgA students in the spring of 2017. The course is based on system thinking analyses of
real world problems, and the aim is to develop applications that use game technology to change
people’s behavior.

The students were divided into groups and could choose from three different tasks; “The Blessing and
Pain of Oil”, which are about the oil situation in the world, “The Paradise Galapagos”, that focuses on
natural resources and tourism, and “The Jordan River trouble”, which are about the water situation in
the Middle East. The students first used System Analyses and made causal loop diagrams, flowcharts,
and then simulate them with System Dynamics. Based on the thorough understanding they gain from
this, they design Gamification ideas to make people use less oil, save water, and think sustainably on
tourism and natural resources.

The course pedagogics builds on Problem Based Learning (PBL), where the class and PBL groups
serves as a “community of practice” where the common goal is making Gamification. The students are
“learning by doing” and the theory is taught “just in time” when needed.

During the course’s gamification theory, the students are taught gamification design, gamification
psychology, and how to use gamification tools such as for example Invison, Unity3D or Unreal, to
implement the projects. The students also make blogs to present their projects.

In the presentation, we will show student examples and give a brief introduction to how the design of
the course was made and implemented. Examples on student applications that will be shown, is
phone applications to save water in shower, using tourists photos to identify illegal fishing, how to
minimize use of plastic bags in shops, minimize driving and increase walking and biking, and water
saving in households.

Keywords: Learning, Game Development, Gamification, Games and Learning, Pervasive games,
Digital Games, Concurrent Design.

1 INTRODUCTION

Gamification has in the last years become a buzzword and is mainly about applying game mechanics
to to non game related topic to increase motivation and learning outcome by doing the learning
process more “fun” and userfriendly. Among others, James Paul Gee [1] has pointed out how good
games can be at doing that, and points out how games can help the player get the overall view and
see boring skill training as a necessary evil to reach a bigger goal. Games further let the player
participate (“learning by doing” and learn when necessary (“just in time”).

Mark Prensky [3] points out that it is not only the game possibilities that have changed, but also the
children -due to their heavy use of Internet and digital media. Not only is their way of thinking different,
but also their brain have changed - they “requires multiple streams of information, prefer inductive
reasoning, want frequent and quick interactions with content and have exceptional visual literacy skills
– characteristics that are all matched in digital game based learning”. They tend to make meaning in
an active way, work in teams and play roles and participate, and they combines fantasy and reality
and want to have fun while doing it. Also Tapscott [4] elaborates on this in his book “The Net
Generation”; “They want to have fun. In fact, 58% of them say that having fun with a product or service
is just as important as what that thing actually does. If you employ any of these people, realize that
they also want to have fun at work. They want to collaborate and have relationships. They want
innovation and creativity. They want speed. They want to customize everything ... this group wants to
do things their own way”. 

By definition gamification inherit the same characteristics as game based learning, and if applied to the younger generation, it should fit better to their background and skills than traditional teaching. Gamification is a broad categorization with many definitions, for example “using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning and solve problems” [2].

We elaborate a bit on this definition and say Gamification is a concept which associates game elements such as competition, point scoring, rewards, game technology and emerging gameplay etc, with an activity. The basic premise is of course to let the players have more fun with the activities, and make them more likely to engage in them and work harder to achieve their goals because they are enjoying themselves and feel more motivated.

It is an important concept for the game students, in this example, to be familiar with and as we shall see, a little different from just creating a game.

2 SCOPE AND OBJECTIVES

This presentation will show the design and student examples from a Gamification course that is taught to second year IgA game students at INN in the spring of 2017. The course is based on system thinking analyses of real world problems, and the aim is to develop applications that use game technology to change people’s behavior.

3 METHODOLOGY AND THEORETICAL ASPECTS

In the teaching we have used mixed methodologies in that we combine traditional lectures in gamification theory with problem based learning. The lectures was done in gamification theory only, while the cases given to the students was problem based and built on various topics they have studied earlier, like system thinking and game design, but now applied to a new situation - Gamification. The students worked in groups with 2-4 students in each group. In the groups they discussed the problems, collected and studied the necessary theory to solve the case, and then did the actual implementation of the task. When they were done, they had to present their work in a web page where each students also had to write blogs about their part in solving the case. At last they presented the solution, the web page and the blogs to the class to get comments.

The environment in which the students work towards creating a gamification, can be seen as a ‘community of practice’. The students all work together towards a common goal in a problem based way. In this environment learning events pops up naturally. At each learning event, the students normally are motivated to solve the task because it let them move further in their game development process, and they rarely find it odd to study the theory to solve the task at hand. A community of practice is situated learning [6] [7], and the fact that the students “make a pervasive game” instead of “learning how to make a pervasive game” is experiential learning [8]. As stated above, the students are “learning by doing” [7] while the learning events pops up naturally “just in time” [1].

4 CASE DESCRIPTION

The course was divided into 4 cases that when done, ended in a complete gamification application.

First the student groups was presented with three different tasks for which to make a gamification application; The Blessing and Pain of Oil, which are about the oil situation in the world, The Paradise Galapagos that focuses on natural resources and tourism, and The Jordan River trouble, which are about the water situation in the Middle East. Each student group selected one of these tasks only, and the first case was about conducting System Analyses on the selected task, by making scenario analyses, causal loop diagrams and flowcharts, and then simulate them with System Dynamics in Stella, a software from Isee systems. Their solution was then to be presented on web and in class for comments from other groups, students or peers online.

In the second case the students were asked to design a gamification example that was aimed at changing people’s behaviour based on the thorough understanding they gained from the previous task, the theory they learned from the Gamification lectures and their previous knowledge in game design. Again they had to present their design on the web, in blogs and in the classroom.
The third case was about implementation; the students were to implement their gamification example in Invision, or in game engines like Unity3D or Unreal. All students chose Invision for this task. As before their work had to be documented thoroughly in the web pages and blogs, and discussed with the class.

In the last case the students had to write a report from the project, where the focus should be on discussing the gamification theory used in their projects. They were urged to show examples from the used theory, and argue why it was selected and used as it was. The report should be scientific and have at least 10 references to used theory.

Below we will show 3 examples that shows how the tasks were solved.

5  EXAMPLES

In total the course had 6 groups and we have picked 3 of them as examples below, one from each sustainability task simulated.

5.1  GalapaSec

This application were made by the following four students - Adrian Ihle, Andre TofteLand, Bård Ræstad and Erik Gjeruldsen. The application is described below using mostly their own words, so we will in the description below, refers to the students.

This example is about the environmental and economic problems on the Galápagos Islands. Fishers on the Islands have been overfishing some species to the point of endangerment, which could be detrimental to the tourist industry on the islands. We wanted to find a solution that could protect both the environmental and economic interests of the Galápagos Islands through a gamified app.

The core mechanic of GalápaSec is the ability to take pictures of boats and submit them to the security force. The goal of this mechanic is to make up for the lack of security personnel. The fact that our target audience (tourists, visitors and inhabitants) actively uses their smartphones enables this gameplay feature, and it is also part of why we initially decided on this target audience.

Quizzes present an alternate path of progression that will appeal to those who want to become more knowledgeable. Hopefully it will also help the user establish a habit of using the app so they will not forget to take pictures.

The first thing we had to consider was how to reward the user for actively using the app. We decided on using points as a reward. These points can be used to reward the user with certain items once the point-goal has been reached. How the user progresses to gain the different rewards will vary, especially when there is an absence of boats. Users can only gain points from a quiz once, and the reward they choose to go for might require them to do extra work to obtain it.

Throughout our app, we use “completion achievements” [10]. These achievements will contain an added point bonus, and unlocks the appropriate badge. All badges are put on display in the user profile menu. Each of the achievements present the users with extra challenges to unlock during their vacation.

The users can cash in their points for physical products at kiosks, such as soda or snacks; a donation to the national park; or as flight miles. Because our target audience is large and diverse, we wanted to give the users the freedom to choose their own rewards. Whichever the user prefers, GalápaSec is sure to offer something for everyone’s taste.
5.2 Poselos

This application were made by the following four students: Brede Johnsgård, Emiel Venema, Martin Lien and Thomas Nilsen

The Norwegian word “poseløs” is basically about shopping without using plastic bags. The reason for this is of course that plastics basically is made from oil, and reducing them will be a good thing in creating a more sustainable environment. The focus is then on the average man doing shopping, and encouraging him to do that without using plastic bags. This is done by rewarding them for not buying plastic bags when shopping for example daily groceries…

Poseløs is an app that runs on any smart phone (see pics below). In the app the user can monitor his own and others use of plastic bags, and then compete with others on being the best. The competition is done on several levels: firstly between municipalities in a county, then between different counties in the country. The user can compare this month, previous months or same month last year or to the average for the country.

The app also let the user compete with family and friends by arranging games, or help others with boosting their performance.
In the app there are several levels of rewards in form of badges and medals. The big reward though goes to the municipality or county that receives extra money or less tax from the government if they are in the lead on being the most sustainable in this task.

The app is meant to work automatically in that the user register his credit card in the app, and the app automatically checks the data from shopping for plastic bags. The app will also communicate with a database that has data from other users, municipalities and counties so that statistics can be updated automatically. The app then is meant for chains of shops, municipalities or counties who wants to appear and work for a more sustainable future.

![Fig 2. Shows the screens of the Poselos App.](image)

### 5.3 Aqua

This application were made by the following three students: Kaya Karlsen, Andreas Hordvik and Paul Wilhelmsen.

AQUA is both a web site and an app that will help people monitor their water use and hopefully motivate them to use less water. The application and the web site will inform the users about their water consumption. The app is inspired by fitness apps like Endomondo (2007), Garmin Connect.
(2009) and Polar Flow (2013) where a smartphone does the tracking and the app primarily displays statistics from the information gathered. The apps will set goals for the users and inform them of their progress towards these goals. The app is meant to be used by a household and will display information from households in the neighbour area. When the user has signed into the app it automatically registers where in the house water is consumed and how much is consumed daily.

The app can be used in any environment, but the students application focused on the Jordan river since this was the area which the studied and simulated. The students were aware that the houses needed a system of indoor plumbing and water sensors to work, but assumed this would be present for this task.

The app has a clean and minimalistic and is designed to be easy to navigate and use. The target audience will as in the other apps be people having a smartphone, but since the app is also developed as a web site it will be possible to do the monitoring there too. The app will need almost no user interaction and water use will be registered automatically from the sensors.

Fig 3. Shows the screens of the Aqua App.
6 CONCLUSION

The examples shown here were not the only ones done, but they give a good presentation of how the tasks were solved. In the above examples Poselos is maybe the one with the most realistic potential for implementation.

The course have potential, for example we could gamify the whole course to give the students a real world experience with gamification.

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REFERENCES


[3] Prensky M. (2007), Digital Game-Based Learning, Paragon House, the United States


