Serious Gaming Module

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Module name: Serious Gaming
Target students: BIT (also recommended for TI and Creative Technology)
EC: 15

Abstract

Serious gaming is one of the new developments in the business environment that gained increasing awareness recently. ICT accelerated this development. In contrast to playing serious games, game design entails the application of knowledge from the modelled domain to a mode and manner in which this is represented to change the players’ knowledge, attitude, or behaviour with regard to the domain. The Serious Game Design Module provides students with a theory driven play centric approach to serious game design. During the module groups of students will develop, play and validate a serious game. The primary aim of the project is to apply and acquire game design knowledge and domain knowledge by “learning by doing”. To canalize the practical project management aspects of designing serious games in multidisciplinary teams an agile project management methodology will be applied and used with sprints of two weeks with biweekly peer student sprint reviews.

1. Introduction

“While most games appear to be effective in terms of creating an environment where students stay on task longer while engaged in the process of playing, little empirical evidence exists that demonstrates games providing any more positive, systematic outcomes for content learning than traditional teaching methods” (Gunter, Kenny, & Vick, 2007). Serious gaming is one of the new developments in the business environment that gained increasing awareness recently. ICT accelerated this development. In contrast to playing serious games, game design entails the application of knowledge from the modelled domain to a mode and manner in which this is represented to change the players’ knowledge, attitude, or behaviour with regard to the domain. Serious gaming forces the developers to engage in in depth analysis of the domain, the dependent variables, intervention effectiveness and suited instrumentation: a product driven scientific multidisciplinary approach.

The Serious Game Design Module provides students with a theory driven play centric approach to serious game design. During the module groups of students will develop, play and validate a serious game. The developed games should have an instructional value in other courses within the University of Twente, or have an added value for external partners. Domains are (but are not limited to) health, logistics & retail, business processes, psychology and game development itself.

During the Serious Game Design Module two parallel tracks co-exist: the serious game design project and a theoretical serious game design track both following a cyclic model (Figure 1):

I. Apply Business Modeling Theory, Create BM for serious games, experiment, and reflect.

II. Create, Play, Reflect of a Serious Game in one application domain:
   a) Logistical game theory, play a supply chain game, create, play and reflect on logistic applications of gaming & simulations.
   b) Health game theory, play obesitas game, create, play and reflect on health app’s.
2. Project
The primary aim of the project is to apply and acquire game design knowledge and domain knowledge by "learning by doing". To canalize the practical project management aspects of designing serious games in multidisciplinary teams the agile project management methodology, for instance SCRUM, will be applied and used with sprints of two weeks with biweekly peer student sprint reviews. The secondary aim of the project is to familiarize students with common used agile project management methodologies.

In Table 1 the general planning of the serious game design track is shown. In the first week multidisciplinary groups of students are formed, game development domains are chosen by the groups and an initial planning for sprint 1 in constructed. During the first week the team roles are allocated, and the initial product backlog and burndown charts are created. Brainstorm sessions will lead to the development of multiple game concepts that will be presented and peer reviewed in week 3. Feedback on this presentation from students and teachers will provide direction for the development of a single final game concept that will be presented to a "grand jury" in week 5. Starting in week five students will be starting with the realisation of the actual (board) game leading to a final presentation "poster market" in week 10. Week 9 will be used for finalizing documentation and logs. For the lectures the flipped classroom approach will be applied.

2.1 Assessment of the project

Formative assessments
In week 3-5-7-9 formative assessments take place during the sprint reviews (progress presentations). Feedback will be provided by peers and teachers as well as professional game designers (week 5 jury review). The feedback will be gathered and presented to the student with the use of gamification techniques enhancing between group competition and motivation. Groups collect points by scoring higher on the sprint assessment criteria and earn badges when milestones are reached. The results will be displayed on Blackboard, enabling social comparison as a motivator. Within the module game mechanics are used to motivate and monitor students’ achievements.
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Table 1. General planning of the project track of the module serious game design.

<table>
<thead>
<tr>
<th>Week</th>
<th>SCRUM &amp; Lectures</th>
<th>Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>- Sprint 1</td>
<td>- Problem orientation</td>
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<tr>
<td></td>
<td>- Introduction Module</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>- Game design &amp; serious game</td>
<td>- Development of game concepts</td>
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<tr>
<td>3</td>
<td>- Sprint review, retro &amp; plan 1</td>
<td>- Development of game concepts</td>
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<tr>
<td></td>
<td>- Game play &amp; Mechanics</td>
<td>- Presentation of game concepts (peer review)</td>
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<tr>
<td>4</td>
<td>- Sprint review, retro &amp; planning</td>
<td>- Development of final game concept</td>
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<td>- Setting, levels &amp; characters</td>
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<tr>
<td>5</td>
<td>- Guest on game design</td>
<td>- Presentation of final game concept (jury &amp; peer review)</td>
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<tr>
<td>6</td>
<td>- Sprint review, retro &amp; planning</td>
<td>- Realisation of final game concept</td>
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<tr>
<td></td>
<td>- Game testing &amp; Evaluation</td>
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<tr>
<td>7</td>
<td>- Sprint review, retro &amp; planning</td>
<td>- Realisation of final game concept</td>
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<td></td>
<td>- Guest Lecture</td>
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<tr>
<td>8</td>
<td>- Sprint review, retro &amp; planning</td>
<td>- Realisation of final game concept</td>
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<td></td>
<td>- Future Directions</td>
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<tr>
<td>9</td>
<td>- Sprint review sprint 3</td>
<td>- Finalizing documentation</td>
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<tr>
<td></td>
<td>- Sprint retrospective sprint 3</td>
<td>- Finalizing final game concept</td>
</tr>
<tr>
<td>10</td>
<td>- Final presentation of game concept (jury &amp; peer review)</td>
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Normative assessment
The outcomes of the project track is used as the main normative assessment for the Serious Game Design Module. The final grade for the project track will be composed out of the following elements:

- 20% Quality of the game / game presentation (poster market);
- 70% Quality of the game design documentation;
- 10% Quality of SCRUM logs.

The game design documentation provides the rationalization and theoretical underpinnings of the iterative (agile) game development process. The quality of the game and the presentation of the final game is assessed during the poster market to potential product owners. Finally since the correct application of SCRUM is a secondary goal of the course, quality of the logs is assessed.

2.2 Learning Goals of the Project

Students are able to:
- apply game design methodologies;
- apply game mechanics;
- apply the SCRUM project management methodology;
- provide structured feedback;
- work in multidisciplinary teams.;
- present projects during poster presentations.
3. Theory / lectures on game design

During the serious game design module students will be provided with the theoretical underpinnings needed for serious game design. State of the art literature will be provided to the students that will be covered during (interactive) lectures. Guest lectures will furthermore provide critical information on the practical application of theoretical concepts and best practices. The lectures are in line with the most salient topic that is covered at that moment in the project. Students are provided with “just in time information” for optimal application of theory into practice. In Table 1 a general overview of the topics that are covered with (interactive) lectures during the serious game design module.

3.1 Assessment of the lectures/theory

Formative assessment
With the used of weekly Blackboard testing students will be assessed on their knowledge of the topics and literature that were covered during that week and will automatically be provided with feedback. These results are also included in the gamified progress monitoring system. Students’ progress will be tracked during the course.

Normative assessment
On an individual level the successful completion of the weekly assessments is obligatory for the student to receive the final grade for the serious game design module. The course will include an exam to test the theoretical learning goals.

3.2 Learning goals of the lectures / theory

Students:
- have detailed knowledge on types of serious games and their applications;
- have detailed knowledge of game design process;
- have detailed knowledge on game mechanics;
- have detailed knowledge on game validation and evaluation;
- have knowledge of the roles, procedures and workflow of SCRUM

3.3 Textbook

Game Design Workshop: A Playcentric Approach to Creating Innovative Games, Third EditionPaperback – March 5, 2014
by Tracy Fullerton

References