

## **Making Social Serious Games: Enabling Knowledge Exchange with a Peer Education approach**

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### **Abstract**

Serious Games are useful in many application areas, but all of these games – even those already connected to Online Social Networks – lack the support for context-aware exchange of knowledge between the players. This can lead to frustration, if game challenges are not solved and players feel left alone. An approach that records in-game solutions, interconnects players and provides this content as context-related help, can be a solution for this information diffusion problem. We propose such an approach for the interconnection of fictional game problems and real community knowledge.

### **Keywords**

Social Games, Serious Games, Knowledge Exchange, Ad-Hoc Communities of Interest, Peer Education

### **ACM Classification Keywords**

D.2.11 Domain-specific architectures

J.4 Sociology

### **General Terms**

Social Games, Serious Games, Knowledge Exchange, Ad-Hoc Communities of Interest, Peer Education

### **Introduction**

Serious Games exist for a broad variety of application fields with a higher-level purpose beyond pure entertainment. Studies show the potential for (playful) learning, effectiveness and motivation [1,2]. But these games are limited in the provided social interaction of players. Well designed according to didactical models, they lack a support for an essential part of effective learning: The consultation of peers. Integrating an interface for social interaction within Serious Games for the exchange of knowledge about strategies for solving the game challenges provides support by peers when needed and can improve the information diffusion in the network (among the players). Social Games studies show, how this interaction in games can increase the player experience [3]. Currently existing Serious Games that are connected to existing Online Social Networks are adding not more than a friend feed or neighbourhood feature like the famous {Farm,City}Ville games do. None of the games provide an interaction support for players to communicate and act on problem-solving together. But we assume that this is how human learning works: appealing problems at hand, the need to develop a strategy for a solution, consultation of others, knowledge exchange, learning from each other and finally solving the problem and gaining new insights. Where is the supportive interface and software design concept for this using the power of existing social networks? We conduct a project developing and investigating the approach of focusing on the creation of a middleware connecting both worlds:

Serious Games and Social Networks. It supports the structured exchange of information about strategic knowledge for problem solving.

### **Motivation**

To adapt most precisely and effectively to current players' skill level and preferred learning styles currently most Serious Games are single player. Even though research makes improvements in adaptation and personalization concerning the flow of game play, there are always situations when more help and advice in a game is needed. That is, because a state of flow [4] and the most benefits for learning are gained with complex game puzzles and problems that attract the players' full attention [5]. For cost reasons each and every eventuality of game play and "getting lost" of players cannot be supported by provision of more help and more tutorials – because of budget limits or no one thought about it.

When players are stuck they usually seek help via (in-game) chat, instant messengers or forums, but there is seldom a context-aware solution integrated into game-play [6].

### **Concept**

#### *Structuring content creation*

We suggest building a software system (middleware) that connects the game situations to structures in social network groups. By this the created structures in discussion groups or forums reflect the game (scene) structures and can be navigated to explore other players' approaches, opinions and (best) solutions. The information is thus organized and structured in relation to the game scenes.

#### *Context-based content access*

When players need additional information about how to approach a current game challenge, the game offers solutions developed by other players in the same (or similar) context before and information from the corresponding social network group section for this specific game context. This choice is displayed either automatically (when player fails) or on request (clicking a button). Players can then review the solutions, reflect the applicability to the current situation and act accordingly (Learning by Example [7,8]) without the need to leave the game or to search in all the available content about the game. From a didactical point of view they can beyond that be only provided with parts of solutions (hints) without the risk, that they see the full solution accidentally (as it is when seeking in forums for advice).

#### *Building sub-communities*

Even though all players can benefit from a common discussion group they are all members off, it is expected that with many players using the game effective learning is better supported when not all players are connected within one huge group. Players with similar skills, social background or player behaviour can be assigned to separate (system internal) groups. To optimize the learning and game-play experience it is an open question which methods to use for this. Methods from social network analysis provide strong concepts for model building to find the significant attributes.

### *Content creation, quality and selection*

The provided solutions are created by automatic screencast recording while players manage game challenges. When the game engine recognized the solution to be complete, it stores it with additional meta-information describing the player's status (learner model, etc.) and the game context the solution was created for (e.g. which problem at which difficulty in which situation). This content is then stored on the game server which holds all data available for the social network and the game. The players can decide whether the content is given public access automatically or only after their own review. Within the community the solutions are visible to all players that solved that problem as well and it can be discussed and rated by qualitative and quantitative feedback (Peer Assessment [9]). Combined with parameters from the player models, these ratings are the basis for an internal ranking used to sort the available content for suggestions made in the game. By this circle of knowledge exchange we hope to create a meaningful interface for each individual to his social network knowledge resources. This network includes mainly the other players, connected only by weak-ties [10,11]. For this reason a direct, in-time interconnection one-by-one is not feasible here. The effort for a weak-tied player to provide individual advice is too high compared to the (weak) motivations arising from knowledge provision to a hardly known community member.

### *Increasing learning by real peoples advise*

When players can access the knowledge content from others in the community within the game and outside the game within the community structures, it supports strongly the learning as arguments and experience of other persons from reality is assumed to be more convincing than any advised help or strategic suggestion generated by the game engine (Peer education [12,13]). The interconnection of game fiction and content from reality makes the difference [14]. The concept of adding more reality to the game has been used by several serious games before (e.g. serious games for political issues<sup>1</sup>).

### **Research questions**

The proposed solution to support the knowledge exchange of peers in Serious Games using social network communities raises several open research questions.

- How can Social Network Analysis be used to optimize a Peer Matching for Knowledge Exchange in Games?
- For which kind of games (beside story-based) is this approach adaptable?
- How can a graphical interface for accessing such content be designed?

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<sup>1</sup> <http://www.globalconflicts.eu>

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