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**DOI**

[10.1145/3130859.3131304](https://doi.org/10.1145/3130859.3131304)

**Publication date**

2017

**Document Version**

Final published version

**Citation (APA)**

dos Santos Fonseca, X., Lukosch, S., Lukosch, H., Tiemersma, S., & Brazier, F. (2017). *Requirements and Game Ideas for Social Interaction in Mobile Outdoor Games*. Abstract from chi play 2017, Amsterdam, Netherlands. <https://doi.org/10.1145/3130859.3131304>

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# Requirements and Game Ideas for Social Interaction in Mobile Outdoor Games

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CHI PLAY'17 Extended Abstracts, October 15–18, 2017, Amsterdam, Netherlands

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ACM ISBN 978-1-4503-5111-9/17/10.

<https://doi.org/10.1145/3130859.3131304>

## Abstract

Challenging neighbourhoods in large cities most often lack social coherence. Meaningful social interaction between citizens in such neighbourhoods is needed to increase coherence, and games may be a means to this end. This paper reflects on the structure of a dedicated game design workshop with teenagers from 12 to 16 years of age designed to this purpose. The relevance of both the identified requirements and the emergent game ideas are presented and discussed together with directions for future work for design of games for social interaction through participation.

## Author Keywords

Mobile outdoor games; social interaction; requirements; meaningful interaction.

## ACM Classification Keywords

H.5.2. User-centred design; K.8.0 Games.

## Introduction

To achieve greater social inclusion, to make people feel they belong to a society, and to value diversity is a challenges that today's society is facing [18, 21]. Social

interaction addresses this challenge, as it enables citizens to communicate, to facilitate social inclusion and coordination, and to develop their capital in social relationships [1, 7, 14]. Mobile outdoor games foster meaningful social interaction through physical activity, engagement, social interaction, mobility, health benefits, and extra motivation and enjoyment [2, 3, 9, 20]. However, for a game to foster meaningful interaction it needs to focus on connecting individuals with different social, cultural and emotional backgrounds [15] and behaviours [5] rooted in different values, education [19] and levels of integration and marginalization in society [17]. The focus of this paper is thus how to design a mobile outdoor game for meaningful, long-lasting social interaction between participants. What are the requirements that need to be taken into account while designing for such game?

This paper reports on the results of a game design workshop that was held with possible future players of a game to address this question. The goal of the workshop is to identify game ideas and requirements for mobile outdoor games that facilitate social interaction. The workshop adopted the Triadic Game Design (TGD) design philosophy [13] to better understand the context of the workshop participants, and what type of activities they like to do by themselves and with other people. The TGD is an established methodology to design games [11], but it had to be adapted for this type of task. The participants of the workshop were teenagers between 12 to 16, and the workshop was held within a school context.

In the following sections, this paper describes the structure of the workshop, reflects on its execution in a

school from Rotterdam South, The Netherlands, and discusses the resulting game designs.

## Workshop

The purpose of the workshop was to design games that foster social interaction. For the children participating in the workshop, the requirements for the games were described as being fun to play, being played in one of the neighbourhoods of the participating children, being played on a smartphone to support mobility and physical interaction, and to engage as many people as possible. The following sections describe the workshop structure in detail, reflect on its execution, and discuss the workshop results.

### *The structure of the workshop*

The structure of the workshop followed a modified version of the TGD design philosophy [11], and is based on balancing the three worlds of reality, meaning and play. The workshop was set up to last three and half hours: It started with an introduction on the purpose of the workshop, the introduction of the domain of the game (social interaction), and the purpose of the game. The participants were divided into groups of 3 to 5 people, and a prize for the best idea was announced.

Following the TGD structure, the workshop itself is composed of three major parts: the characterization of the neighbourhood, the brainstorming of the game requirements, and the design of the game. This structure was slightly modified to fit the targeted participants best: the detailed process of designing the game was modified to follow a commercial card deck<sup>1</sup>.



Figure 1: Characterization of the neighborhood (the neighborhoods where they live and where they would like to play the game).

<sup>1</sup> AddingPlay. <http://gamification.playgen.com/>

This card deck has been developed to brainstorm and explore game mechanics, social mechanics, player motivators and victory conditions, to support gamification of the design workshop. It was chosen as, in comparison with other established frameworks for game mechanics analysis [6, 8, 10, 16, 22], it is simple to use with a playful focus on game design.

In the first part (Figure 1), the participants describe the reality aspect of the game by identifying their neighbourhoods on a map of Rotterdam, as well as critical actors, artefacts and activities in this area. The participants also define on the map in which neighbourhood they would like to play the game, and then draw a picture showing the relations between the identified actors and artefacts. As the meaning of the game, i.e. the increase of social cohesion by social interaction, has been discussed prior to the workshop, this aspect is not further discussed with the participants of the workshop during this phase. The goal of the workshop is established beforehand, and asking participants about the world of meaning would make the workshop longer in duration and more difficult to achieve good results with the targeted group. Instead, the second part focuses on brainstorming on the game requirements for a game, as a challenge (with a prize to win). At the beginning, several videos of a) existing games and b) hardware used in games that foster social interaction, are shown to provoke discussion. After the videos, each group identifies a set of activities that they like to do (or could do) by themselves, and a set of activities that they like (or would like) to do with other people in their neighbourhood. Next, they brainstorm about activities that would lead to joint game activities, and identify the people they believe should be playing the game as well (even if not

directly). Knowing these details, the participants then define where (major locations), when (suitable times), and how (which devices) the game ought to be played, and decide on a name for their new game. The last major part of the workshop is dedicated to the actual design of the game, a process that is gamified: game ideas are created with the support of the card deck, and entered into the competition, points are attributed, and the winning game idea renders a prize for each element of the winning group. To this purpose, participants draw random cards from the card deck. For each drawn card, they need to imagine how a game idea could include that feature. For e.g., if a participant draws the card "Reward", then h/she needs to think of a way to attribute points or items for a player's effort or achievement. At the end of this part, each team should have come up with at least one specific game idea (e.g. Figure 2), one of which (the one they consider best) is pitched to all participants of the workshop. After pitching, all participants vote on the most promising game idea and a winner of the game design challenge is declared.

After all of these three phases have been executed, and the winning game identified, there is an open discussion to collect feedback from the participants. Each participant is asked why they have chosen a particular game idea, what they like the most in that game idea, and what they like in the other game ideas. The feedback is given verbally and recorded for further analysis.

#### *Participants*

The workshop was held at a school in Rotterdam South. 16 students (4 girls, 12 boys) volunteered to participate in the workshop. After the introduction,



Figure 2: One of the game ideas in the contest: The Voice of South.

these students were divided into three groups. Each group was moderated by two facilitators (either researchers, teachers, or stakeholders of the project). The focus of the workshop, on conceptualizing games that connect individuals from different backgrounds, is addressed by the participation of volunteers that come from a geographical area with a high variety of ethnicities. Reflecting this fact, the participants had a varied ethnicity as well.

#### Location

Rotterdam South is the starting point of this research, particularly the area of the Feijenoord Soccer Stadium. This area is strongly multi-cultural, with citizens with many different ethnic backgrounds (Figure 3) [12]. This area was (and likely still remains as) the third biggest area of Rotterdam in terms of overall distribution of the population of the city [4], with more than 68 thousand people in 2010.

#### Game ideas and requirements

Three small groups rendered five game ideas. Three game ideas ("Keep on Running", "RealCraft", "Eat and Go") are designed to be located in the park Zuiderpark in Rotterdam South, while the other 2 ("The Voice of South" and "Water Ball") do not have a specific location. The game ideas are presented below in more detail.

**Keep on Running:** The game idea is a competition between two teams of players collectively to accomplish certain physical tasks in their environment, and also setting challenges for the other group. The group that accomplishes the tasks first, wins gold. During the tasks, the teams have to deal with enemies ("monsters") that try to hinder them in their quest to

accomplishing the tasks at hand. Players can also choose a single-player mode, where individual physical tasks contribute to their team's score (e.g. box club, or sports club). Players or teams have to look for virtual and physical objects in their environment to increase their powers in the game (e.g. run faster, or jump higher), and are allowed to choose their own avatar (the avatar gets stronger and leaner during the game play). The game starts when a player enters the game world and forms a team by sending out messages to others nearby (on the street) asking them if they would like to join the team to play the game.

**RealCraft:** This game idea is based on Minecraft<sup>TM2</sup>, where players can collect assets and build virtual objects. The game allows for players to fight against enemies (e.g. zombies, and the creeper as in Minecraft<sup>TM</sup>), earn points with battles won but also on their objects built, improve and customize their avatar (e.g. new clothes, or more colours), exchange messages (e.g. to trade, collaborate, or build), and to scale the game up to whole Rotterdam/The Netherlands). Players can collect assets from the environment (e.g. wood, stone, or sand), trade and exchange assets with other players they meet in the game, and build virtual objects in the environment (when together with other players and with a combination of different types of assets). Once such virtual objects are built, other players can see them too.

**The Voice of South:** The game consists of recording people singing or making music in their own neighbourhood, after which the game would enable

Birth Country of Parents (E 2016)

Netherlands	316,009
Western country	76,908
Morocco	43,064
Netherlands Antilles	23,941
Suriname	52,584
Turkey	47,778
Other country	69,322

Figure 3: The population development of Rotterdam. Municipalities in the boundaries of January 2017, visited on 25/04/2017.  
<https://www.citypopulation.de/php/netherlands-admin.php?adm2id=0599>

<sup>2</sup> <https://minecraft.net>

#	Activities
1	Do physical activities together or teach these activities to others (e.g. cook, sports, dancing, singing, water balloon fights, etc.)
2	Collaborative gaming (even with unknown people)
3	Interactive gaming (communicating with other players)
4	Finishing assignments (sense of accomplishment)
5	Challenging other players
6	Competing for a reward (e.g. points, medals, or virtual currencies)
7	Doing Voluntary activities (help others)
8	Having a combination of virtual and physical objects
9	Improving the world (their neighborhood) through the game
10	Virtually representing themselves through avatars

Table 1: Activities that the participants (would) like to do (in the game).

others around to listen to it on the street and rate a player's performances on a public leader board. The best songs/raps/clips would be on top of the leader boards and get social status and visibility.

**Water Ball:** This game idea consists of having people throw virtual balls at each other using their smartphone. Instead of losing when being hit, the player receives points from the thrower/attacker, and h/she only gets points when different people have thrown balls at him/her. The purpose of the game is to have players connect with people they have never seen before, to get to know each other.

**Eat & Go:** This game consists of collecting points by walking around or challenging other people in sports competitions. The points collected by the players can be used to acquire virtual food from supporting companies for free, and the more points a player collects, the more variety of food the player can acquire. This game can be adapted to things other than food, and can also consider joint activities among the players (e.g. Flash Mobs, voluntary work like garbage collection or helping others repair things).

Regarding the activities that the participants (would) like to do, either by themselves or with other people, these are (along with the game concepts) interpreted in this research as potential requirements for the actual game (Table 1). These activities are seen to be tasks that the end player is looking forward to play in the public space and with other people, even though it is difficult to account for/combine them all into a coherent game.

### Discussion

The general idea of co-designing a game to facilitate social interaction worked well, generated promising ideas, and was overall a fun and productive process (Figure 4). The workshop's structure produced clear requirements and usable game ideas. Instead of delivering a detailed game idea, the workshop delivered several activities of what the intended future players would like to do, also mirrored in the several defined game ideas. They further provided a more accurate understanding of the neighbourhood and the context for the game. Table 1 shows the 10 activities that participants mentioned the most, and these range from physical activities that allow for collaboration/competition and interaction with the community, to the usage of technology to augment the real world. The game concepts are based on the increasing point attribution for each time the player "meets" different people in the game (Water Ball), the joint development of an augmented neighbourhood (RealCraft), challenges that can only be achieved when two (or more) players come together (Eat & Go), do activities together (The Voice of South), and games that make use of artefacts in the neighbourhood (Keep on Running).

The workshop was created in order to identify game ideas and requirements for mobile outdoor games that facilitate meaningful social interaction between future players. On top of this objective, the workshop itself provided an environment that positively affected social interaction across different groups of participants: the participants cooperated with their colleagues to devise game ideas; they all had the same challenge to win (which gave them a common ground despite differences across participants); they competed with

other groups via active communication and exchange of ideas (which created social integration and shared knowledge); and they created intimacy with other participants throughout the workshop activities.

In reflection, there are also lessons learned for future workshops. The groups produced results of varying quality. Its structure did not exploit participants' creativity to the fullest, as it was more mentally demanding (no physical activity involved) and not all participants clearly understood the competitive nature. Its duration was also a challenge for this age group. The discussion after the workshop was a challenge. Only a few participants explained which game they had voted for, and which activities they liked, while the rest of the participants agreed what was being said. This created a general impression of what the students liked most and what they did not like, but did not provide insights on who voted for what, why, and in which activities they were particularly interested (not just the game ideas they voted for).

Future workshops can benefit from having more practical assignments (e.g. writing, or drawing), spend less time mapping out the neighbourhood in detail, improve motivation or expectation management (e.g. better examples to motivate the participants, better group formation, and expectation management at an early stage), and more play (supported by the card deck) at an earlier stage in the workshop.

### Conclusion

This paper provides a set of requirements and game concepts acquired during a design workshop for mobile outdoor games for social interaction. During this workshop, future players co-designed activities to

engage and interact with other individuals in problematic neighbourhoods. The feedback, the requirements, and the game ideas gathered from the participants allow for social interaction and inclusion. The approach taken addresses this challenge by providing useful insights on what to consider in future games designed for social interaction: mobile outdoor games should have physical activities, facilitate interaction through communication and collaborative/competitive behaviour, clear-cut assignments with rewards, and enhance the real world with virtual and physical technology.

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Figure 4: The winning team, and price attribution.

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