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Games in Urban Planning – a Comparative Study

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1 ABSTRACT

The purpose of this paper is to show and discuss the results of a comparative study of games for urban planning. We provide an overview of the selected games available on the market. Because of the variety of offered games, we decided to group them in categories distinguishing among non-digital/traditional, digital and pervasive. The group of non-digital/traditional games includes some well-known, but also some recently developed games: Broken Cities, CLUG, Ginkgopolis, Masterplan, Neue Heimat, Pop-up Pest, Stadtspieler and The Harbour Game. In the category of digital games we considered: Anno, City One, Civilisation, Community PlanIt, Green Sight City, Minecraft/Block by block, Plasticity, Securing Sydney´s Urban Planning, SimCity and Surfing Global Change. The category of pervasive games included: Mogi, PacManhattan and REXplorer. We compared them according to the predefined criteria including participation, interaction, realistic visualization, learning effect and knowledge transfer. One of the positive aspects comprehended that there are some games used for integrating people in urban planning processes. The critical aspects included that there are many games focusing on urban planning issues, but only little were used for integrating people in active urban planning processes. We conclude our paper with a critical discussion of the results of our study and a reflection about further research on games for urban planning.

2 INTRODUCTION

The development and implementation of games in urban planning is an emerging research and application area. Games can show abstract and very specific planning processes in a playful way. Players can take on different roles in a game and act according to the unique requirements and rules of the game. For example, an environmental activist and a real estate investor can make different decisions due to their different roles in an urban planning process.

Research about games in urban planning (Abt 1972, Sanoff 2000, Borries; Böttger; Walz 2006, Lange 2007, Poplin 2011) discusses the use of games for attracting people to participate and learn about urban planning processes in a playful way. It can be seen as an advantage in which games can enable players to make decisions in an experimental, game-based environment (Sanoff 2000, page 76-79). Related to urban areas von Borries explains: “Spaces are realized in another way during playing in them. Not just simulation is in the front, also engagement and enthusiasm of the actor and so the examination of the gaming object – the city” (Borries; Böttger; Walz 2006, page 43).

In addition, games are also often criticized, because they predominantly implicate fun. These are the most common and popular games which have purely an amusement function. Furthermore, there are serious games, which include in addition to entertainment serious aspects. One of the first experts Clark C. Abt defines serious games as: “Games which achieve an explicit, cautious, educational function and whose major feature is not just entertainment. That does not mean games should not be enjoyable; they can be used to impart knowledge in a playful way” (Abt 1972, page 5 ff.). This leads us to an important question: Are there actually games, which can entertain people and simultaneously animate them to participate in applied planning processes as well as facilitate learning about the current process in a playful way? This question motivates us in our research.

The structure of this article is as follows: In Section 3 we review the different groups of games which are relevant for this paper. In Section 4 we explain the research methodology, and the evaluation and results of the comparative study. In the same section we critically discuss the results. Conclusions and ideas for further research are presented in Section 5.

3 SELECTED GROUPS OF GAMES FOCUSED ON CITIES

The game industry is multifaceted and the focus on cities is very popular. Some of them are serious and include realistic visualizations of the city or city district. A few games also enable knowledge transfer, which means that concrete information about a planning situation is given. Many of them just aim to entertain the

player. In this paper we distinguish among three categories of games: non-digital/traditional, digital and pervasive games. This three groups cover most of all games. This games can be serious or just used for entertainment. Non-digital/traditional games can be played without using electronic means or computers. This can be board- and card games like "CLUG", which is an applied education game. The player learns about influence and relationships of urban growth. Recently, digital games, which use computers and electronic devices, come to the fore in urban planning (Poplin 2012, page 198). PC-games like SimCity are very famous. In this game, the player has to create a successful working city. The third category includes pervasive games, which got popular since the invention of internet and its fusion with GPS-capable mobile telephones. In these games, the borders between virtual and physical almost disappear. According to Montola: "The family of pervasive games is diverse, including individual games ranging from simple single-player mobile phone games to artistically and politically ambitious mixed reality events" (Montola 2009, page 7). Recent technology allows completely new playing areas which are used for example by geocaching in the game MOGI.

3.1 Non-digital/traditional games: board- and card games

This group includes well known, but also recently developed games. The selection covers the description of the following games: Broken Cities, CLUG, Ginkgopolis, Masterplan, Neue Heimat, Pop-up Pest, Stadtspieler and The Harbour Game.

Broken Cities: is a competitive city building game published in 2011. At the beginning of this role-play, the user has to choose whether he wants to be a polluting profit chasing landlord or a green-minded real estate mogul. It is placed in an abstract real world. The player can see the consequences of his decisions in real-time. The interaction consists of dealing with implications of other players decisions irrespective of how their own team behaves (Suarez; de Suarez; Juhola 2011).

CLUG (Community Land Use Game): 1965 developed by Allan G. Feldt as a game for education. It is based on a board with 144 squares representing lots of land. The transport is operated on the streets. A port, a terminal and a supply center are included in the game. One player acts as a moderator and takes the part of an instructor. He works as a neutral visitor and defines the rules of the game, keeps the rules observation, gets the transport fee and can also announce unexpected catastrophes. The use of this game is to show the player essential relationships, which determine the urban growth (Diekmann; Leppert 1978, page 51-58).

Ginkgopolis: entered the market in 2012 as a strategy card game. The player represents an urban planner. The activity is composed of designing, developing and controlling a city. It offers high interaction because all players are permanently involved in the game by overbuilding and replacing each other. To reach the goal, the player has to collect points of success via planning, urbanizing and building (Z-Man Games 2014).

Masterplan: was generated in 2011 as a tactical game for two persons. The board game shows a masterplan and the included figures are houses, parks and towers. The game process provides the possibility to construct a city on the masterplan. The goal of this game is to build houses as close as possible to the parks and towers to get the most winning points (Lach; Rapp 2013).

Neue Heimat: was also published in 2011 and deals with urban topics and actors like a mayor, real estate investor, speculator, special permit or local recreation area. The gaming process allows real estate speculation. New plans of land development, new deals in credits as well as new buildings can arise. Interaction runs through the whole game because there are no waiting times for each player. There is no "next to you", all players are permanent in the game with buying something at an auction (Zoch 2013).

Pop-up Pest: was presented as educational game in 2012. This game was especially made for children, which live in Budapest, Hungary. According to their wishes, they could design the city and make fictive urban plans. The lying on the floor game board is 25 m2 and shows the map of Pest (part of Budapest). Pest includes touristic attractions as well as a deprived area with urban deficiencies. The children who played the game, live in this part of Budapest and should express their needs and wishes in their environment via Pop-up Pest. There were several missions to fulfill. Urban interventions were symbolized by building blocks, which are divided into: environment, transportation and culture. Interaction took place by acting together, collaborating with other players, helping each other, working in a community and discussing about urban planning issues. The player took on different roles during the game. The purpose of Pop-up Pest was to

support children in learning about their environment as well as understanding possible changes in urban spaces (Tóth; Poplin 2013).

Stadtspieler: was published in 2003 in Leipzig, Germany. Since then it has been often used in civic participation processes in urban and regional development. The game bases on a board which can be adapted of particular situations (Fig. 1). The attendant city can be built with putty by the players during the game. The purpose of the game is to create a high quality living environment. To reach this goal permanent role-play is intended. Communication is crucial and the players can develop a common level of language over the game. Interaction turns out to be informing, creating, communicating, controlling, analyzing and evaluating. This game makes the complexity of planning processes practical (Ullrich; Pohl 2005, page 38-40).

Figure 1: Stadtspieler event with TRENDBÜRO Hamburg 2011(Photo: Felix Borkenau) and the game board. www.stadtspieler.com

The Harbour Game: was developed in 2003 as a mixed reality game. It aims to promote the development of the harbor in Aarhus, Denmark. The port is built on a large game board. The players can discuss possible problems and ideas, inform others about the development and share texts and photos. There are two playing alternatives: An expert-mode with complex rules and detailed information and an public-mode with simple rules and abstract problems. In planning processes people mostly are integrated after a plan has been finished. The purpose of the game is to change the existing procedures in urban planning and integrate people earlier in the process. (Lossing; Nielsen; Lykke-Olsen; Delman 2007, page 388).

3.2 Digital games: PC-games

First games for computers were researched and designed at universities. With an emerging distribution of personal computers and gambling machines (later consoles), PC-games became popular also among the citizens (Lange 2007, page 16 - 19). Today, the technical progress makes games in fictive 3D-visualizations possible. The player can get a feeling of being directly in the virtual world. By now the industry of PC-games is a mass market and serves various games for different user groups. We considered games, which deal with urban planning aspects and selected the following: Anno, City One, Civilisation, Community PlanIt, Green Sight City, Minecraft/Block by block, Plasticity, Securing Sydney´s Urban Planning, SimCity and Surfing Global Change.

Anno: was developed as one player game in 1998 with the aim to simulate economic systems. First the player can colonize an island, build a city and satisfy the inhabitants' needs. With rising requirements also the missions, that the player has to fulfill, grow up and the steps of civilization become more complex. There are diversified interactions for reaching the main goal: create a prospering city. Many computerized rivals complicate the defense and conquest of the players´ island. All characters in the game are male, which can be considered critically, especially for those who might want to choose a female character.

City One: entered the market in 2010 and was created as a serious game by IBM. The base of this simulation game is the reality; there are more than 100 real world scenarios included in the game. It was developed for special users like city planners and government agencies. The main player´s activity is to convert a city through technologies that save water, reduce traffic congestions or by choosing alternative energy sources. Players learn how to balance the city' interests including finances, environment and sociology. The purpose of the game is to create a green environment with a limited budget. The user can communicate (or interact) with other players or IBM experts (IBM 2014).

Civilisation: was designed in 1991 as a global strategy PC-game. It is the player´s job to lead a nation from the Neolithic to the present age, up to colonization of a new planet. The purpose of the game is to assemble

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an own empire which is bigger, more productive and more progressive than the competitor's one. The aim of this game is to get money and force. Social and ecological aspects grow up in the latest versions. In the meantime interaction is given by diplomatic relations and negotiations with other civilisations (Fischer 2013).

Community PlanIt: is an online game platform and part of the research project "Engagement Game Lab" founded at the Emerson College in Boston. This game was produced as a local participation game. The function of the game is to impart joy for planning in a community and additionally to communicate knowledge about the city and community living in the city. Its purpose is to optimize the communication between all stakeholders as well as to share information and involve communities in planning processes. The users can learn about the impact of games, social community planning processes and local participation. Each game can be adapted to particular planning processes in a commune. It is available via facebook and Twitter. First the player has to complete different missions, assist in a planning process, and win money. The players interact, share their stories and show their ideas. They also communicate, discuss and make new connections with other players. The earned money can be pledged to a local project, and the player can make real immediate impact. The purpose of this game is to make better places by the community because the answers and annotations will be used by the planners (Engagement Game Lab 2013).

Green Sight City: is a social game which was published by the Daimler-Benz group in 2011. The player can reconstruct an existing city into an ecological one. The economic system can be boosted without getting a gridlock and without additional pollution of the environment. The purpose of the game is to rebuild a common city into an ecologic operating city. Interactions are affected thru other facebook-gamers in replacement, help and giving hints. The aim of this game is to impart knowledge about eco-friendly mobility, renewable energy as well as innovative technologies (Neymeyer 2011).

Minecraft: entered the market for single- and multiplayer games in 2011. The player can release recourses in an imaginary world and converts it by using objects needed for building and defending houses. Besides the only action is to fight against computer-based monsters. At first sight this game is not directly connected with urban issues. But since 2013 it is used in real life to get real convertible results. This "Block by block" called game (Fig. 2) is a partner project between Minecraft, UN-Habitat and UN-Agency. It is used for young residents of problematical areas to take part in planning processes. It started in Nairobi, where people could create urban areas with the help of blocks. The purpose of the game is to redesign 300 public places till 2016 (Persson; Bergensten 2011/ Westerberg 2013).

Figure 2: Block by block Playground Undugu. Westerberg 2013.

Plasticity: was used as project for urban planning from 2004 to 2006. It was a multiplayer PC-game with the focus on the city of Bradford. In the first step the players could change the lake´s water level. After that they could implement collaborative strategies for urban planning. Interactions could happen between game designers and urban planners and were based on dialogues. One of the purposes of Plasticity was to enable the residents to experiment playfully and explore their own urban environment. They also could learn collaboration and that they are not able to change their city by themselves. They also could participate in a mutual exchange of suggestions and planning acts (Fuchs 2007, page 370).

Securing Sydney´s Urban Planning: is the latest developed (2013) computer simulation. It is based on an interactive replication of Sydney´s central business district (CBD). The player can act as the brain of the game; he can measure security problems related to public and private places in the CBD, design and redesign the buildings, etc. This game also offers unforseen events like floods, explosions, emergencies as well as varying weather patterns. It is made for urban planners, architects and developers and is available via facebook and Twitter. Also the exchange between players and experts works via social media. The purpose of the game is to develop the capacity of Sydney´s CBD and to change the way of thinking about the use of space (Strachan 2013).

SimCity: the first version appeared on the market in 1989. Several novel versions have been developed since then. The game plays in a virtual world. The player is in the role of the major and has to build up a city from zero. Avatars, called "the sims", live in the storyline and act like instructors. The factors of influence are broaden to crime, environment, traffic flow, education, infrastructure and missions. The purpose of SimCity is to create a prosper city. The use of waking people´s interest of geographical information software is visible. But there is also criticism, for example social aspects are lacking (Devisch 2011, page 26-30).

Surfing Global Change: was designed in 2003 for education as a role game. The player can learn to understand the contents; he can write about and reflects upon his own attitudes, ponder aspects of topics and has the chance to win chips. He gets to know with bargaining of complex consensus. Users of this game can be apprenticed urban planners, architects or civil engineers. In the fore is communication with each other. The use of the game is learning how to bargain in order to reach a solution for the problem. The user can learn about social processes in situations of negotiations (Handler; Trattnigg 2011).

3.3 Pervasive games: games in urban environment

Pervasive games are also engaged in topics of cities. New technologies open the possibilities to explore urban areas. The reason why urban games are sold successfully and became mainstream trend, is for example the affordability of GPS technology as well as the social integration via internet (Bitz 2010, page 3). We decided to present three games, which act in urban environment: Mogi, PacManhattan and REXplorer.

Mogi: was invented as a multiplayer, location-based role-playing-game in 2000. It was used for geocaching on the streets of Japan. The course of action consists of choosing geocachers from a list and entering coordinates of the geocache into the GPS device. The player can use his GPS device to assist others in finding the hidden geocache. After finding it, he can sign the logbook and return it to its original location. At the end the player can share his stories and photos with other players. They feel united because they can work in teams on common missions. This game combines offline and online activities. The purpose of this game is to explore new ways of interaction (Joffe 2007, page 224).

PacManhattan: is one of the most popular video games published as Pac-Man in the USA in 1980. The playground is originally based on a labyrinth which was adopted in Manhattan in 2004. The labyrinth was changed into a map of the city. This adoption aimed to establish a connection between the virtual and the real world. The game consists of controlling a little yellow figure called Pac-Man in the labyrinth. His challenge is to eat a specified amount of "dots" to get points and reach the next level. He is followed by four ghosts. The purpose of the game is to stay alive and collect points as long as possible. In practice, a player wears a Pac-Man-Suit, ranges the area around the Washington Square Park and collects dots along the streets. Four more players are wearing ghost suits and try to catch Pac-Man. They can communicate via mobile device and internet (Lantz 2004; Müller-Lütken 2012).

REXplorer: is a pervasive game for tourists published in 2007. It enables mobile guided tours through the city of Regensburg in Germany. It is made for tourists, especially for younger people, to show them the history and culture in a playful way. The story is based on secret mystic symbols written on a gravestone. These symbols are connected with transcendental activities in Regensburg. To research this connection, fictive scientists designed an interactive mobile phone (Fig. 3). They can interact in front of significant buildings. The player gets answers to different questions via this phone. He is guided through the whole city. At the end he can create a souvenir-blog, where he can see and share his experiences of the day. Also a map of his walk is shown on the mobile device (Ballagas; Walz 2007, page 366).

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Figure 3: REXplorer map and technological equipment. Ballagas; Walz 2007, page 367.

4 COMPARATIVE STUDY

The aim of our paper is to compare different games according to the predefined criteria. These criteria include participation, interaction, realistic visualization, learning effect and knowledge transfer. In our study we compared twenty-two games shortly described in Section 3. We selected the most popular games as well as some of the recently developed ones. We informed about the use and the publicity and we showed diversified contents as much as possible. We took extracts of the categories non-digital/traditional, digital and pervasive games. First we matched the games inside their three groups and showed the connection between games and criteria. For example we compared inside one group how interaction in each game is given, which methods are used and if there is social media involved. Then we evaluated which one implies all criteria. At the end we presented the results of comparing with positive aspects and critiques.

4.1 Criteria for comparison

We focus on participation, interaction, realistic visualization, learning effect and knowledge transfer in our research. “Participation” means that interested people and residents take part in planning processes in concrete places with the help of the game. In our definition the game relates to a practical situation or a planning project. The user´s requests and needs can be included in the planning process and its implementation. A direct link between the game and the development plan can be established within the game environment. “Interaction” consists of talking, writing or discussing with each other. This can happen among the users or in a discussion with experts. They are able to communicate and/or even to compare their notes. The results of their interaction can be exchanged via social media, for example facebook or Twitter. “Realistic visualization” supposes that the story of the game plays in a real, existing city. This city can just be the base of a fictive storyline. But it can also include a real planning process in this urban area. This depends on the particular situation. “Learning effect” is given when players find out something about correlation and interdependency in the planning structure or learn about the city. They can get to know about extensive planning systems by playing the game. They can also argue with other positions and learn about different perceptions. This criterion means common learning effects. In contrast to learning effect, “knowledge transfer” communicates facts and figures about a real planning situation or a practical city. Then concrete information is indispensable in the game. Contents are always linked to the real-world knowledge related to the current projects and places in the city. The more criteria a game exhibits, the merrier it fits to our research question. If there are actually games, which can entertain people and simultaneously animate them to participate in authentic planning processes as well as facilitate learning about the current process in a playful way?

4.2 Results of the comparison

We compared the games inside the groups of board- and card games, PC-games and games in urban environment. To represent all games according to the criteria clearly, we made some graphs (figure 4, 5 and 6). The colored fields show the games which are analyzed. The criteria are arranged on the x-axis. It is shown which game includes which criterion. The size of the colored fields is irrelevant, it adapts according to the number of games. In this way it can directly be shown which criterion includes lots of games and which less. We present the quantity of each field.

4.2.1 Comparing board- and card games

The eight described board- and card games have similarities and differences. Participation was used in four games: Broken Cities, Pop-up Pest, Stadtspieler and The Harbour Game. All games include interaction. Communication was in the fore. In all games player interacted with other users or experts. As shown in Figure 4, realistic visualization was implemented in only three games: Pop-up Pest, Stadtspieler and The Harbour Game. Stadtspieler can be adapted to every planning situation; it inserted realistic visualization as well as participation. Including Broken Cities and CLUG as an official game for education, these five games offer real knowledge transfer and learning effects. People got to know about the complexity of urban planning processes in general. How to discuss and behave as well as what to respect in this process. The Harbour Game gave a lof of information about the needs of Aarhus and the importance of the harbour. Residents could inform them and according to this, they could add their needs and show their ideas. Pop-up Pest was the only game especially made for supporting children in learning about urban planning issues. Ginkgopolis, Masterplan and Neue Heimat are primary tactical games with more entertainment aspects than education. Ginkgopolis and Neue Heimat enable only interaction. We could outline that only three games had realistic visualization: Pop- up Pest, Stadtspieler and The Harbour Game. Four imparted participation and six of eight games had learning effects. Interaction was enabled in all games.

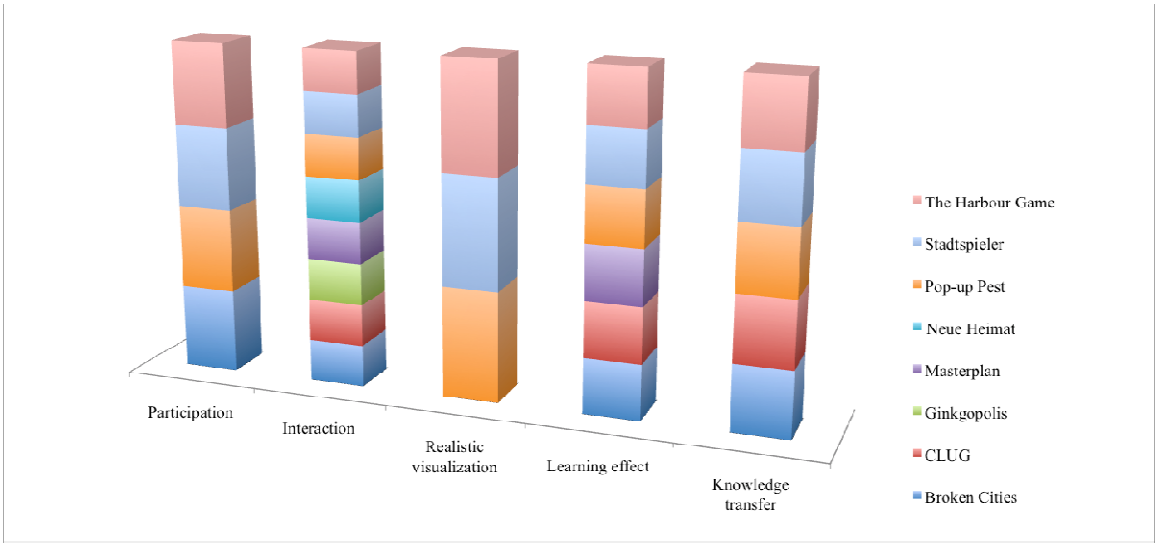

Figure 4: Board- and card games and their criteria.

4.2.2 Comparing PC-games

Only Block by block, Community PlanIt and Securing Sydney´s Urban planning imparted participation. People could take part in the authentic process and their ideas influenced the implementation. Communes continued processing with the outcome of the game. Interaction was all over given. Online games made an exchange with social networks like facebook or Twitter very easy. Thereby the possibility for communication grew and networks could increase. Many games included discussions with experts. It was demonstrative that Minecraft covered just the criterion interaction, but the game which resulted from it (Block by block) covered all criteria. In the field of PC-games it became apparent, that there were many games which focus on entertainment. We could present also some games which had realistic visualization of the real-world cities (Fig.5). These games had real knowledge impact and learning effects. Anno, Civilisation and SimCity are very popular games, but they serve primary entertainment. The player just experienced about little realistic connection in urban planning systems. The learning effect as well as the use for participation function was very low in this three games. Altogether eight games had learning effects and seven games offered knowledge transfer.

4.2.3 Comparing games in urban environment

Participation was completely missing because all games acted in the city, but not in relation to planning processes (Fig. 6). All three games had placement in real-world cities as well as using the urban area as a board in common. The player could move in physical, real-space and was dependent on interactions. Communication and common exchange was essential for the players of the game. This could be enabled via

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networked technology or inside a group. The basis was the reference to the real world. Mogi enables players to learn interacting with geographical information and getting along with maps in the environment. REXplorer is the only game, which conveys real knowledge about a real-world city. The player is guided through the city along important buildings and places of interests. He could learn about the history in a playful way. The characteristics of the game REXplorer were in contrast to the features of PacManhattan. The main challenge was just catching Pac-Man and collecting dots. This game had just an entertaining function and did not involve any education.

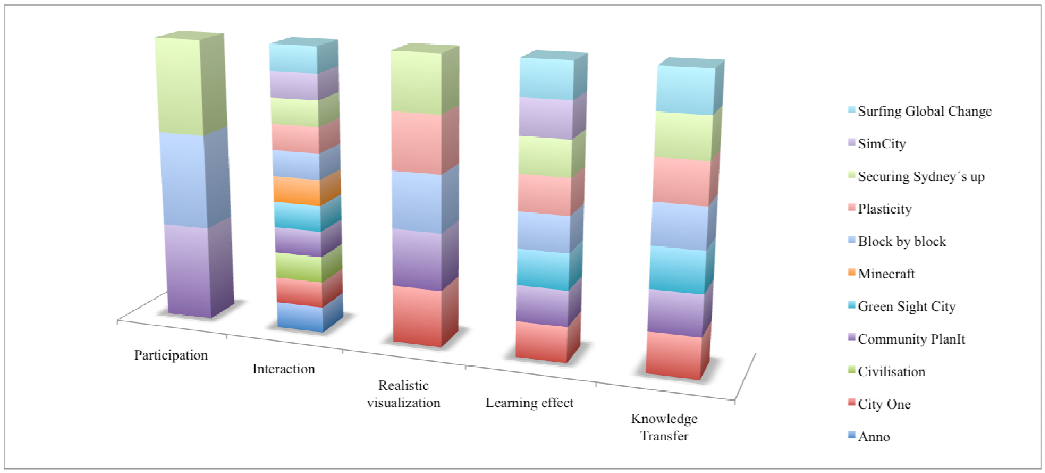

Figure 5: PC-games and their criteria.

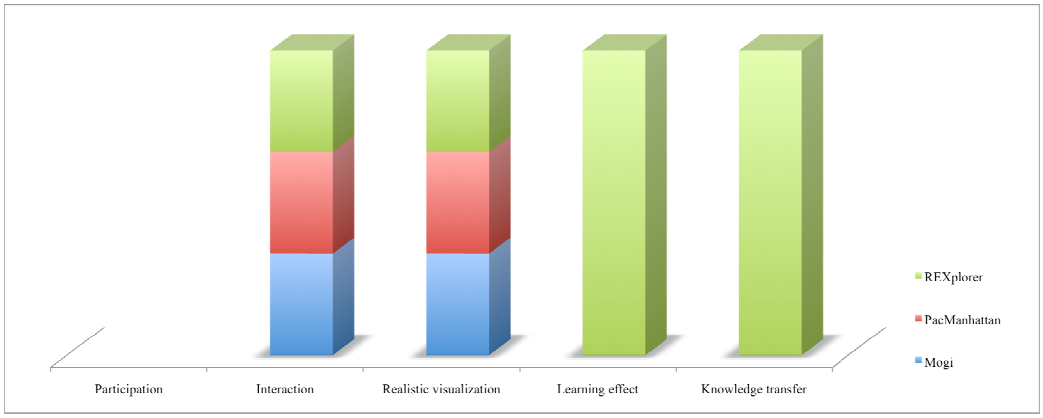

Figure 6: Games in urban environment and their criteria.

4.3 Discussion

Even though we analyzed many games, we just found five games (Block by block, Community PlanIt, Pop-up Pest, Stadtspieler and The Harbour Game) that match our research question: Are there actually games which can entertain people and simultaneously animate them to participate in applied planning processes as well as to learn about the current process in a playful way? These five games implemented all predefined criteria and were developed with the purpose to support urban planning processes. Pop-up Pest focuses even children in learning about their environment and understanding changes in urban areas. These games might have a crucial impact in current planning processes. They are exemplified and transferable for other projects.

Surfing global change was developed as educational game. It focuses on learning effects and interaction but without any realistic visualization. The entertainment function in this game is low.

Actually games in urban environment included only few of our criteria; this group did not satisfy our research question. All three games could entertain people, but they were not used for participation in real-world planning processes. These games arose in the recent years due to the novel technological possibilities. We could not find games enabling participation in this group. The selected list is limited and some novel games might be on the market, which include the possibility to participate in urban planning processes.

We can conclude that we found five of twenty-two games, which entertain people and simultaneously animate them to participate in real-world planning processes in a playful way. Block by block, Community

PlanIt, Pop-up Pest, Stadtspieler and The Harbour Game are our current examples for games that combine participation, interaction, realistic visualization, learning effect and knowledge transfer.

Positive aspects:	**Critiques:**
Some games were on practice in urban planning. → 5	Participation (7 games) and realistic visualization (11 games) is low. → Less than half of all games.
All games are designed for interactions and possible learning effects are high.	Especially games in urban environment don´t offer more than just entertainment.
Although a game like Minecraft seems to be unfitting to urban issues first, a successful game for real planning processes could be developed.	There are lots of games with urban planning issues but they are not sufficiently are used for integrating people in real-world planning processes.
Only some games enable pure entertainment (8 of 22).	
The applied games could already show successful results. → For example Block by block got ideas for redesigning public places by players, which are used for further planning.	

Table 1 summarizes the positive aspects and critique of the analysed games.

5 CONCLUSIONS

Games for urban planning can show planning processes in a playful way and they can facilitate participation and interaction. In Section 2 we stressed that games are often criticized because of their only focus on an amusement function. We tested twenty-two games and five of them complied with our criteria: participation, interaction, realistic visualization, learning effect and knowledge transfer. Only eight of twenty-two games implicated just fun. We can conclude that although there are entertaining games, we also found several serious ones.

In this article we concentrated on finding games that satisfy our criteria. This turned out to be a complex task. The games industry offers a mass on commercial games which focus urban planning aspects. During our research we found many games in which a player had to create a prospering city, similar to SimCity. Getting detailed information about these games was complicated. We were always sent to the official game homepage, where information were just visible with a registration. Unknown games as well as board- and cardgames were hard to find besides the mass of popular ones. If games were used in communes, they were often hidden. It was difficult to get serious information about games that focus urban planning processes.

We reflected our predefined criteria and one of them is “interaction”, which consists of talking, writing or discussing with each other. We focused on the relationship between users among each other. According to Salen and Zimmerman, interaction can also be the interactivity between the game and the player. They mention: “The relationship between the player´s choice and the system´s response is one way to characterize the depth and quality of interaction” (Salen; Zimmerman 2004, page 57 ff.). There are several definitions of interaction, but the connection between action and outcome as well as many forms in which interaction can come through the game, is very interesting too. In our former research we will add other levels of interactivity to our criteria.

The practice of using and implementing games in urban planning can help people to find out what they really need in their urban environment. Block by block is a good example for a game that enables non-experts to upgrade space in a slum area via a PC-game. This game can be transferred to other situations. For example if a public place has to be redesigned, users could place important objects like street furniture in the virtual place. They could see costs, planning documents as well as administrative barriers. They could get to know arising circumstances in a concrete project.

PC-games enable simulations of realistic scenarios in an easy way. Board games can be produced faster than PC-games, but they require a higher imagination. At this time ideas with focus on planning processes could not be implemented in the environment. Upcoming technological innovations will make those games possible. We can imagine a game for example, in which users could play geocaching with real street furniture and objects for public spaces. They could play together in groups, catch important elements and place them for example on a real market place. People could create a concept for this place and show their

needs. The groups could be divided into topics like “green”, “furniture” or “lightning”. One benefit could be, that players see directly their results and discuss in the environment which is the content of the planning process. Those games require a higher effort than a PC-simulation does. But here residents could connect new technologies with play, discussion and participation in the real world.

The games industry has a rapid development. New games will be evolved soon and this comparative study is a kind of snap-shot. We hold that rapid development has also potential for designing more games that motivate people to participate in real processes. We are especially interested in designing a pervasive game that participate people in planning processes. In our research we found only one game (Pop-up Pest) that was specifically made for children. We will create a game, that especially invites marginal groups to participate. We would like to cooperate with a commune and develop a game that motivates concerned migrants for example.

6 REFERENCES

Abt, Clark C. (1972): Serious Games. New York.

Ballagas, Rafael; Walz, Steffen P. (2007): REXplorer. In: Space Time Play – Computer Games, Architecture and Urbanism: The next level. Editors: Borries, Friedrich von; Walz, Steffen P.; Böttger, Matthias. Page 366-367. Basel.

Bitz, Kate (2010): Fun & Games. Urbane Spiele als räumliches Phänomen. Bachelor-Thesis in Urban Planning, HCU Hamburg.

Borries, Friedrich von; Böttger, Mathias; Walz, Steffen P. (2006): Ausweitung der Schießzone. Computerspiele im urbanen Raum. In: Archithese, book 4, page 43.

Devisch, Oswald (2011): Sollten Stadtplaner Computerspiele spielen? In: Bauwelt 24.11, page 26-30. Hasselt.

Diekmann, Peter; Leppert, Heribert (1978): Planspiel und Planspielsimulation in der Raumplanung. Basel, Stuttgart.

Engagement Game Lab (2013): Your Community. Your Future. https://communityplanit.org. Retrieved December 10, 2013.

Fischer, Matthias (2013): Civilisation. http://www.civilized.de. Retrieved December 10, 2013.

Fuchs, Mathias (2007): Plasticity. In: Space Time Play – Computer Games, Architecture and Urbanism: The next level. Editors: Borries, Friedrich von; Walz, Steffen P.; Böttger, Matthias. Page 370-371. Basel.

Handler, Martina; Trattnigg, Rita (2011): Zukunft der Öffentlichkeitsbeteiligung – Chancen. Grenzen. Herausforderungen. http://www.partizipation.at/fileadmin/media_data/Downloads/Zukunftsdiskurse-Studien/zukunft-der-oeffentlichkeitsbeteiligung.pdf. Retrieved December 10, 2013.

IBM (2014): City one. Real World Game, Real World Impact. http://www-01.ibm.com/software/solutions/soa/innov8/cityone/. Retrieved January 28, 2014.

Joffe, Benjamin (2007): Mogi. In: Space Time Play – Computer Games, Architecture and Urbanism: The next level. Editors: Borries, Friedrich von; Walz, Steffen P.; Böttger, Matthias. Page 224-225 Basel.

Lach, Bernhard; Rapp, Uwe (2013): Spielen, klar doch! http://www.klarspieler.de/1.html. Retrieved January 28, 2014.

Lange, Andreas (2007): Places to play. In: Space Time Play – Computer Games, Architecture and Urbanism: The next level. Editors: Borries, Friedrich von; Walz, Steffen P.; Böttger, Matthias. Page 16-19. Basel.

Lantz, Frank (2004): Pacmanhattan. http://pacmanhattan.com/about.php. Retrieved October 10, 2013.

Lossing, Tobias; Nielsen, Rune; Lykke-Olsen, Andreas; Delman, Thomas Fabian (2007): The Harbour Game. In: Space Time Play – Computer Games, Architecture and Urbanism: The next level. Editors: Borries, Friedrich von; Walz, Steffen P.; Böttger, Matthias. Page 388-389. Basel.

Montola, Markus (2009): Games and pervasive games. In: Pervasive games – Theory and design. Editors: Montola, Markus; Stenros Jaakko; Waern, Annika. Page 7-22. Burlington.

Müller-Lütken, Jürgen (2012): So kam Pacman auf die Welt. http://www.onlinespiele-sammlung.de/pacman/about-pacman.php. Retrieved October 10, 2013.

Neymeier, Nico (2011): Green Sight City – Das Spiel für eine grüne Zukunft. http://blog.daimler.de/2011/11/10/greensight-city-das-spiel-fuer-eine-gruene-zukunft. Retrieved December 10, 2013.

Perrson, Markus; Bergensten, Jens (2011): Minecraft. https://minecraft.net/game. Retrieved December 10, 2013.

Poplin, Alenka (2012): Playful public participation in urban planning: A case study for online serious games. In: Computers, Environment and Urban Systems. Editors: Thill, J.C. Page 195-206. Charlotte, USA.

Salen, Katie; Zimmerman, Eric (2004): Rules of play: game design fundamentals. Massachussets Institute of Technology.

Sanoff, Henry (2000): Community Participation Methods in Design and Planning. Canada.

Strachan, Fran (2013): Securing Sydney´s CBD. http://newsroom.unsw.edu.au/news/design/securing-sydneys-cbd. Retrieved December 10, 2013.

Suarez, Pablo; de Suarez, Janot Mendtler; Juhola, Sirkku (2011): Broken Cities. http://www.nord-star.info/attachments/article/41/Broken_Cities.pdf. Retrieved December 10, 2013.

Tóth, Eszter; Poplin, Alenka (2013): Pop-up Pest: An Educational Game for Active Participation of Children and Youth in Urban Planning.

Ullrich, Annette; Pohl, Georg (2005): Spiele als Instrument der Gemeinwesenentwicklung. In: Sozialextra, 10/2005. Page 38-40.

Westerberg, Pontus (2013): First Minecraft workshop in Kibera! http://blockbyblock.org. Retrieved December 10, 2013.

Z-Man Games (2014): Ginkgopolis. http://zmangames.com/product-details.php?id=1200. Retrieved January 28, 2014.

Zoch, Klaus (2014): Neue Heimat. http://www.chili-spiele.de/. Retrieved January 28, 2014.