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Gamified participation

Challenging the current participation methods in urban development with Minecraft

Architecture & Design, Aalborg University
Group 4 – MSc04 URB June 2019

Title page

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Master Thesis for	Urban Design
	Institute of Architecture & Design,
	Aalborg University

Semester:	MSc04 Urban Design
Group:	4
Title:	Gamified participation.
Subtitle:	Challenging the current participation methods in urban development with Minecraft.
In collarboration with:	Shapescape
Time period:	February 1st 2019 – June 7th 2019
Submission date:	May 23th 2019
Pages:	95
Appendix pages:	5
Supervisor:	Nicolai Steinø
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Abstract

This thesis investigates the effects of utilising gamification and serious games as participatory tools in the urban planning process. Typically participation today is limited to public hearings and light means of eParticipation, often in the form of social media debates or web-based surveys or questionnaires. Public hearings are an old concept by now, and while functional for some citizens, much of the following material points toward it being ineffective at garnering the interest of young families and those even younger. Generation Y, accustomed to doing things in their own time, and very well acquainted with navigating virtual worlds, may well benefit more and be more inclined to participate through digital media; maybe even from the comforts of their own home.

Further, virtual tools may work to increase the spatial understanding of a development in those attending, in particular, interactive virtual tools, which is the very core of digital games. This thesis, therefore, utilises the process behind the development of Budolfi Square in Aalborg to compare the conventional method of citizen involvement with a gamified version. For this purpose, Minecraft is used as an example, allowing 17 interviewees to experience the planned buildings of Budolfi through Minecraft, and express how immersing themselves into the game affects their understanding of the site.

Findings have been condensed into a folder, attached to this thesis, strongly recommending further testing and usage of new methods in real participation settings; both to get a better understanding of the problems and advantages this carry, but just as importantly to not fall behind the tide of gamification washing over the world, but instead ride it.

Acknowledgement

This thesis was done under supervision by PhD Nicolai Steinø, associate professor at Aalborg University, who has provided much useful criticism and advice throughout the process. PhD Marcus Löchtefeld, also an associate professor at Aalborg University, provided valuable feedback on the technical aspects of the thesis, guiding the process through the complexities of game design and cognitive gains from virtual environments.

Much inspiration was gained from Arkitema Architects and Aalborg Municipality, who set aside time for interviews with select employees knowledgeable in the fields of VR representation of designs and public participation processes respectively.

The Minecraft model, made based on drawings provided by the authors of this thesis, was created by Shapescape and donated to the project. Shapescape produces digital gamified recreations for educational and participatory events. Their contribution came with no bindings or requirements to the project, but solely in return for access to the findings of the research and permission to use the material in the future.

A deepfelt thanks go out to all of the above and their contributions to the project.

Reading guide

It is recommended to read this report before the attached 'Gamification & urban design' folder. This report contains the entire work process and gathered information throughout the thesis, the folder contains a much-condensed presentation of select facts and tendencies, along with informed opinion and arguments on how citizens should be involved. Hence, this report gives the necessary understanding and knowledge to fully know why the, in the folder, presented ideas have been thought up.

This report is divided into eight chapters, the chapters can be seen either on the top or right side of most spreads, with the current chapter marked in bold.

Each chapter starts with a descriptive abstract of the contents of the chapter and ends with either a summary of key-takeaways or a conclusion to the given chapter, allowing for a quick introduction and summarisation of each chapter. Lengthier sections in a chapter may also start with a brief description of the content in the section. During the report Harvard will be used as a referencing system.

Parts of the report are based on interviews and a questionnaire. Transcriptions, questions and answers have not been translated to stay true to the exact wordings, these can be read in the appendix. Quotations and analysis done in the report itself are translated by the authors. QR codes with transcriptions and other interview material are available in appendix. Furthermore, the digital Minecraft model can be downloaded from a QR code in the appendix and a guide to install it is provided.

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Illustration 1: Gammeltorv near Budolfi.

Introduction

This section contains the fundamental parts of the thesis in order to describe the theme participation and citizens spatial cognition throughout serious games. In this section, a general introduction is made to the essential topics, and in later sections, they will be expanded to further a clear understanding. In this chapter, some fundamental problems with participation will be laid bare, in particular, the lack of developments in the field of common participatory processes in municipal developments. When involving the regular citizen, speaking a language and using methods the regular citizen is accustomed to may not only mean the involvement of more citizens, but also more fruitful processes.

The chapter goes on the introduce the topic of gamification; a means to make trivial and complicated tasks alike more approachable and motivating through the means of game elements. One branch of this is serious games, where a genuine game is used to educate players of topics outside the game. The section will introduce the idea of using gamification to involve citizens in urban planning, allowing a more meaningful communication and more enjoyable process through this platform.

Lastly, the chapter will put a brief mention to spatial cognition, and how the perception of designs can be enhanced through virtual interactable worlds.

Introduction

Citizen Participation in architectural and particularly urban design processes is nothing new. Since the sixties, it has been common practice to involve citizens in some capacity (Cogan and Sharpe, 1986). The participation is often performed through one-way information sharing from the decision-makers to the public and through public hearings where people may voice their concern during a limited timeframe on a particular day at a particular stage in the design process with a pre-decided wiggle-room for making changes to the design (Carver, 2003, p. 62).

For years this has been the commonplace method of involvement, but the question is if it should be? As early as 1969 Sherry R. Arnstein would suggest that some vital parts to the involvement would often be found to be lacking. With a lack of information, participants can have a hard time evaluating the plan made by the decision-makers their foundation of opinion can be insufficient. If that is the case the whole process becomes a charade; an act performed to appease the public and score political points on being inclusive in decision-making, even when the decision-maker in truth is not (Arnstein, 1969). Even more fundamental than the need to allow, facilitate and respect meaningful two-way communication, is the absolute requirement that the participating parties are informed about the project. If a citizen does not fully grasp the implications of future plans, how are they to give insightful feedback and advocate their case in the process? Does the average citizen understand the plans and chapter cuts presented at a hearing, or is it specialised gibberish produced by and for those skilled in working with space and volumes? If they do not see the urban environment resulting from the presented plans for their inner eye, is the hearing not meaningless, even if the decision-makers actually would make changes to the design according to the wishes of the citizens?

These are some of the criticisms and questions the following thesis will seek to investigate. It will be questioned if the current method of citizen participation is the right one, or if it is merely the one we use because, so it has always been. New opportunities created by the rise of digital technology and the internet are investigated, and the benefits and disadvantages of eParticipation sought to be revealed. In particular, the topic of gamification is one with a deficiency in the amount of research done. Games play an ever more prevalent role in everyday life of citizens around the world, yet little research has been done on how citizens expanding knowledge of this medium can be used to convey urban design ideas. The little research that has been done is centred around custom games created for specific projects. These are expensive to make, and so not sustainable for the individual project, on top of that they are foreign to the user.

Instead, this thesis is done to investigate the potential use of existing games, games that allow a high degree of customisation and games that the user is likely to know in advance. This would decimate costs of gamified participation, and make it more accessible, but at the cost of specially tailored games for the specific situation.

Applying these new methods to the case of Budolfi Square in Aalborg, Denmark, it will be tested if the spatial understanding of the plans can be improved for the citizen, and if two-way communication can be facilitated in a more meaningful way, than by allowing the select few most local citizens to voice their concerns at a hearing. How, and just as importantly, when in the planning process should new methods be utilised, and what demands and costs does it place on the authorities, entrepreneurs and landlords responsible for the projects? The thesis will investigate if the changes are feasible and realistic, and what advantages and disadvantage follow a gamified planning process.

Illustration 2: Location of Budolfi Square in Denmark.

What is citizen participation?

Citizen participation is simply put the process of providing private individuals with the option to engage with and influence public decisions. A process that has long been a cornerstone of the democratic process, with examples tracing as far back as ancient Greece (Parker, 2003). With the institutionalisation of citizen participation in the sixties, starting with the Great Society programs by US President Lyndon B. Johnson (Cogan and Sharpe, 1986), it became clear that citizen participation could be many different things, with wildly different effects on the processes in which the citizens were involved (Arnstein, 1969).

The particulars of different categories of participation will be described in a later section (Participation, starting from p. 14), but one important distinction in types of involvement is whether it is the 'have' or the 'have-not' citizens who are involved.

Sherry Arnstein describes the 'haves' as citizens who already have an influence on public decision-making (1969, p. 216). Often this would be people who have economic leverage or politically powerful people who can sway public opinion, and so often are involved in assuring political stability in the decision-making. The more interesting category of citizen participation is the process that involves the 'have-nots'. These are people who without elaborate citizen participation schemes and programs would not have any influence on the decision-making process. Engaging these citizens democratises the process by involving a much wider scope of the population, and so steers away from the more technocratic approach of letting specialists make the decisions in their field alone, without pressure from the general public. It is this latter form of participation, the involvement of the 'have-nots', that this thesis will refer to with 'citizen participation' going onwards.

Citizen participation can be employed across a number of fields, but this thesis will solely concern itself with citizen participation in the spatial planning processes. Participatory planning processes can be time-consuming and costly affairs (Arnstein, 1969; Parker, 2003), but they do allow the general public to all provide ideas and opinions on how their local environment should appear. The specialist can then use these inputs when designing the final solution, with the goal that this solution is one that the most possible parties can be happy with.

The topic of citizen participation has been relatively steady for decades after the norm of public hearings settled, but with the rise of the internet, and so much more readily available information for the general public, new opportunities have become available (Carver, 2003). In a world where internet-based discussions, polls, et cetera (eParticipation) and digital communication methods allow for better and faster conveying of information, not just from the decision-makers to the public, but also from the citizens to the decision-makers, citizen participation have the possibility of becoming more readily available for all, with all the advantages and disadvantages it bears (ibid.)

Illustration 3: Participation illustration.

What is gamification?

This section explores the term gamification and explains examples of how it is used in ordinary days in general and in the planning process. Games have existed in many years to entertain people; it can be traced back to the bible (Masser and Mory, 2018). A relatively new concept is developed in the latter part of the 20th Century where people started to consider the games as a way to increase productivity in everyday life: gamification, in this case a game-like user interface to enhance the commercial electronic devices (Growth Engineering, 2018). Different games and platform can be used in urban planning and architecture processes; analogue and digital games or platforms. In this thesis the focus will be the digital platforms in order to make it possible for the participants to interact from home or other avalible places.

One definition of gamification "*game elements in non-game contexts*" (Thiel and Ertiö, 2018) can be explained with the following example. SAS uses gamification in everyday life. When flying with SAS or Star Alliance points are earned every time the 'SAS Eurobonus' card is used. Points can be used for purchasing new tickets or for food on the journey. Upon reaching 12 flights in 12 months, more advantages are unlocked in the airport or during the flight. This progress comes with new titles, like going from 'member' to 'silver'. This is a way of making people choose SAS instead of other airlines.

Gamification does not turn everything into a game, but it is about finding the monotonous activity that usually requires collaboration and engagement (Brigham, 2015). Gamification can be very simple small elements, like in Stockholm where the stairs of one metro station saw little use over the escalator until each step was made into a piano key playing sounds as people stepped on the steps. Staircase use rose 66 per cent (Kapp, 2012, p. 3).

The game elements used in the non-game context can utilise the work of librarians, educators, or in business to help make everyday life and education easier; gamification has been used to engage college students, train pilots and floor managers alike and help develop new businesses, and those are just a few examples out of numerous (Kapp, 2012; Brigham, 2015).

Serious games are a relatively new term and can be defined as: "*games designed to support other functionalities than solely for entertainment*" (Poplin, 2011, p. 3) and it can be said that "*applying games and simulations technology to non-entertainment domains results in serious games*" (Ibid). Serious games are the type of gamification this thesis will focus on since the games are to inform and create a spatial understanding in citizens.

The gamification trend is growing, with no signs of slowing down; in fact, over a fourth of people playing games have passed the age of fifty; in 1999 that number was only at 9% (Kapp, 2012, p. 18) and the total amount of gamers is on a rapid rise (Statista, 2019). Being conservative, and not respecting this growing industry, and the consequences it is likely to have on other industries like urban design would be a mistake, making gamification a very relevant topic to research and get a better understanding of.

Illustration 4: Piano stairs in Stockholm.

Spatial cognition

Going back in time Lynch (1960) define the term 'mental maps' and 'wayfinding' and how people individually experience the city. Lynch made a study of how citizens understand the city by making them draw a map of a specific area. These maps show that citizens notice different elements based on their personal experiences or attention to landmarks. These terms are the founding concepts of 'spatial cognition' (Medyckyj-scott, 1992). Medyckyj-scott (1992) describes how people think differently about space: "*Space cannot simply be described in terms of a shared and objective reality, because every individual's abilities, experience, knowledge, and assumptions about the world will result in many different cognitive models of space.*" (1992, p. 216). Furthermore, he describes how individuals store knowledge concerning space and that knowledge is different from individual to individual. Every 'cognitive map' includes different representations of knowledge about spatial understanding (Medyckyj-scott, 1992, p. 217).

Architects are thinking visually and can solve problems visually (Mehul Bhatt, Christoph Hölscher, 2012, p. 132). It is not every citizen who is able to think visually and they may have a hard time thinking in 3D if the only information presented is in 2D. When the player is moving around in a virtual world, it can contribute to the spatial understanding of the model.

According to Medyckyj-scott (1992), it is important to interact with the space to gain an understanding of the space in the model. He further emphasises that while interaction may come at a loss of complexity in the model, this may not be disadvantageous.

> "***[…] This means providing the user with a consistent and coherent conceptual model, so that the user can form a mental model of the system which corresponds to the designer's model of the system. […] will be difficult to use if the concepts which it incorporates do not match the user's understanding of a domain; i.e. if they are too complex for the user to understand or if the concepts themselves are incomplete or inconsistent.***"
>
> (Medyckyj-scott, 1992, p. 220)

Accepting that presentation of space is not necessarily presentation of details, and that the way we remember spaces is a very individual thing, is the first step to realising that for many, new unconventional ways of representing space may be an improvement. In this thesis such tools will be explored, and a high focus will be put on the interactivity of the platform, even if this comes at the cost of some of the realism that can be produced in specialised tools for professionals.

> "***effective interaction between users and spatial information systems will depend on the recognition of the users' spatial representation; the users' expertise with the system; the users' experience of graphic presentations […]***"
>
> (Medyckyj-scott, 1992, p. 223)

The focus will be on investigating peoples ability to interact and comprehend the spatial scene presented through digital gamification, and how the perception compares to the on gained through conventional plans.

Spatial Cognition is a highly complex field with many mysteries yet to be uncovered. It is not the goal of this thesis to shed light directly on these topics, but hope is that the results may be of use in later research by those proficient in the field of spatial cognition and how the mind works. Merely, the knowledge that being able to move around in space and being 'in' rather than 'above' space helps comprehending the space, is the basis in spatial cognition from which this thesis will take off. Instead the thesis will focus its efforts going forwards on the effects of gamification on the participatory process, with spatial cognition limited to the question on whether or not the citizens understand the plans presented through gamification.

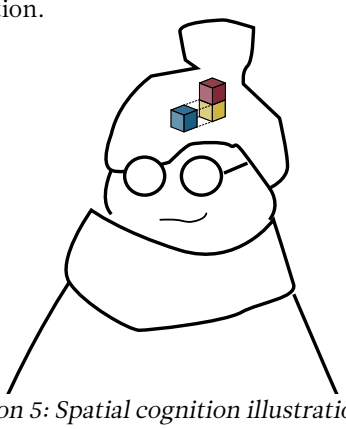


Illustration 5: Spatial cognition illustration.

Initial questions

Based on this introductory insight into the fields of participation and gamification, multiple sub-topics needing insight to establish what is known and what should be further researched to conclude upon this thesis eventually:

-Why should decision-makers prioritise better citizen involvement?

-What keeps some citizens from participating?

-What problems do citizens who do participate face?

-What are the benefits and disadvantages of eParticipation?

-What does gamification involve? What separates it from just a game?

-What benefits does gamification have over simulation?

-How do graphics impact spatial learning from games?

-How has gamification been used for participatory purposes before?

Investigating these questions further will give the required information to be able to identify gaps in knowledge on the field requiring more research, along with an insight into how gamification may best help urban design as a field.

Illustration 6: Budolfi Square participation process.

Participation

On multiple parameters, the health of a community can in part be measured by the degree to which citizens engage themselves in their local environments, including the planning process. This makes it worrying that the last few decades saw a significant decrease in social capital in American societies, suffering from new societal tendencies also present in the rest of the modern world. While the level of civic engagement has stabilised, it is crucial to maintain this stability and make efforts to increase engagement further. This includes engagement in urban planning.

Urban developments are often better liked and see more use if the process has had a robust participatory nature behind it. How robust participation is measured is however a question with many answers depending on the objectives of the developer. This chapter will, however, underline how many of the main concerns that a decision-maker may have when involving citizens are unjustified, and at times even have the opposite effect.

The chapter investigates how the weak points of engaging citizens, both at the end of the citizen and the decision-maker can be covered, in particular how technology may assist in this endeavour through eParticipation.

The importance of civic engagement

Civic engagement is essential to many aspects of society, ranging from our mental well-being to the appearance of our public squares and how inclusive they are towards the citizens who wish to utilise them. In his book 'Bowling Alone'(2000), Robert D. Putnam describes the declining social capital of America. Utilising numerous sources of evidence, Putnam painted quite a solid picture of a steady and rapid decline in engagement from people into their local and stately environment. While centred around America, some of the root causes for this trend are conditions that are found in most of the western world, if not most of the world in general. An example would be increased commuting times, which Putnam points to as significant drainage of people's social capital, the resource spent to engage with the people around us. This is a factor not isolated to the USA, with Denmark, for instance, having seen a rise in commuting times of 9% from 2008 to 2018 (DTU, 2018; Valdimarsson, 2018). Other examples for global or semi-global trends that contribute to the problem include increased time and monetary pressure and social media.

Regardless of such pressure to civic engagement, most of Europe, in particular, the western part, are yet to see any significant decline in participation, and some countries like Denmark have even seen a slight increase (Sarracino and Mikucka, 2015).

'Bowling Alone' caused a fair deal of worry in the western world (Sander and Putnam, 2009), and with good reason, as the book had laid out evidence for several negative side-effects of a decrease in social capital. Listing poorer education with less attentive pupils and staff, more unsafe neighbourhoods, financial consequences, poorer democracy and maybe most importantly severe health and happiness impact, a dwindling civic engagement carries a whole host of very negative potential symptoms (Putnam, 2000, pp. 287–349). As such it makes much sense to increase the focus on recovering from the decline in the US and maintain the current levels as a minimum in Europe.

Now it is important to realise that while a lower social capital does mean a lower participation rate in political projects such as local planning processes (Putnam, 2000, p. 45), the effects mentioned by Putnam stretches far beyond citizen participation. This also means that improving and focusing on citizen participation will not be the entire solution to a dwindling social capital, but it can be a step on the way.

It is also interesting that the trend has turned. Generation Y has since the early 2000s started to turn the trend, and since 2006 achieved a steadily higher rate of civic engagement and political participation (Sander and Putnam, 2009). Generation Y is defined as people born in the early 1980's to mid 1990's. (Wikipedia, 2019) This is indeed very positive, assuming the many negative traits of low rates identified by Putnam can be recovered from. It is now important that those who wish to participate are offered the tools and platforms to do it, and that the participation process is taken seriously (more on this in the coming section on eParticipation, *page 22*).

Another thought that might strike the mind reading into Generation Y stepping up to the participation table is exactly that no change has been found in prior generations (Sander and Putnam, 2009). Those in the prior generations who participated before generally still do, but few new have joined in. "*There are not much young people. Unless the studens have a special intrest for it. And not at all families with small children. [...] It is typical a bit older group.*" (Højlund, 2019). This could lead down two paths:

A) efforts should be made to increase the rate of participation in older generations; or

B) it could be said that the groups still participating in former generations appear to be sufficiently happy with the participation systems as they are, and the focus should be on increasing accessibility and continuing the positive trend currently found in Generation Y, and hopefully soon in Generation X and Z.

Naturally, this is not an either/or, and both may be achieved, but allowing oneself to separate the generations also allows for the development of tools tailored much more specifically to one group. As will shortly be discussed in this thesis, this is quite relevant for eParticipation, and the divide in technological capabilities caused by the leaps of digital advancement made during the childhood of Generation Y (Carver, 2003).

The ladder participation

With the blossoming of citizen participation in the sixties, Sherry R. Arnstein saw a need to categorise different kinds of participation, from some that are downright non-participatory to the case of full citizen control. While she makes the blunt definition that citizen participation equals citizen power (1969, p. 216), meaning citizens having the power to influence the decision-makers, she also points out that the term at times can be distorted towards extreme ends of the spectrum. The term could see use ranging from meaning absolute power to the citizens to barely meaning the providing of rather poor information to the people. At the time, and perhaps still, this wildly different perception of the term made it challenging to discuss citizen participation and to which extent this should be enforced. As such Arnstein formulated a ladder-model to provide an approximate categorisation of different types of citizen participation, with each rung on the ladder representing a different kind. The higher a decision-making group went on the ladder, the further towards absolute citizen control they would be. The ladder looks at the involvement of the previously mentioned 'have-not' citizens.

On illustration 7 the ladder can be seen as first formulated. It is important to note that the rungs are very general, and that a higher rung is not necessarily better than the prior; that all depends on the particular project (Masser and Mory, 2018, pp. 42–47). For instance, placation, where citizens are invited into decision-making panels, but with no way to actually make decisions may be perceived as a rotten rung with far to fall. The citizen is well informed of the process, and so even more infuriated by the inability to truly participate (ibid.). Similarly delegated power or full citizen control may lead to technically inappropriate or unfeasible results, or to much too long decision processes (Carver, 2003). Further, the ladder does juxtapose the powerful and the powerless, putting them at opposite ends. This is rarely a precise division, as both the haves and have-nots are not homogeneous blocks, and their interests may overlap and differ across as well as inside their groups. (Arnstein, 1969, p. 217).

The ladder has since been reformed multiple times, with various arguments as to where it falters and different more specific ladders targeted at certain decision processes (see for instance Wiedemann and Femers, 1993; Carver, 2003; Masser and Mory, 2018). However, for the remainder of this thesis, the original ladder will be referred to, as that provides a reliable base categorisation of public participation across different kinds of planning processes.

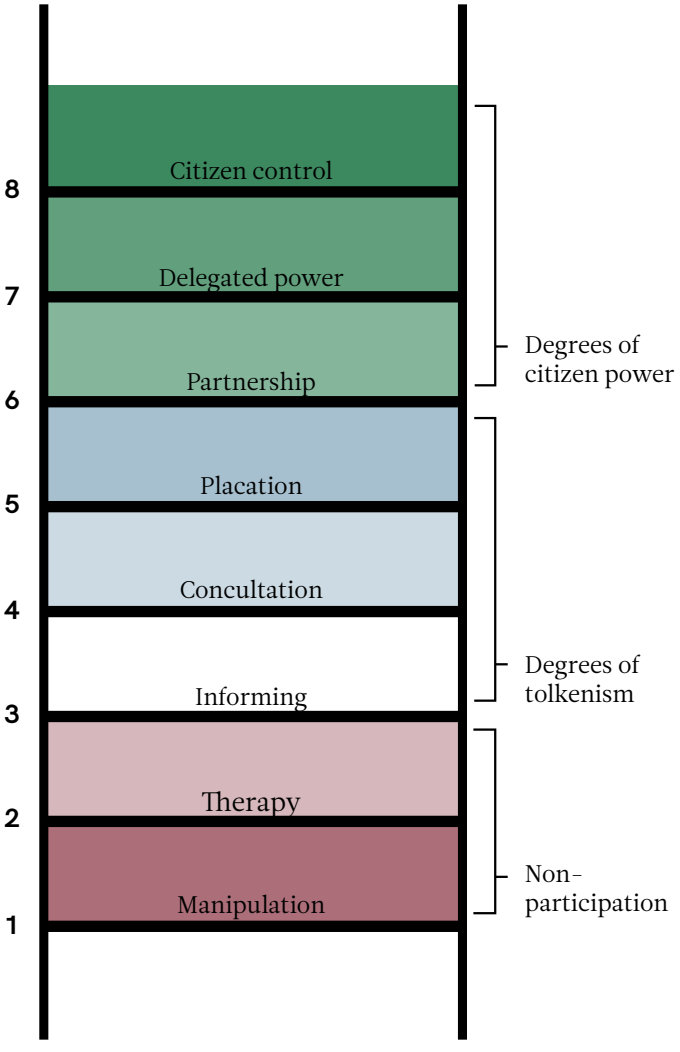


Illustration 7: Ladder of participation. Made with inspiration from Arnstein (1969)

Benefits and challenges with participation

Choosing whether to involve citizens in the planning or design process in a city and choosing how much to involve them, is the choice between a technocratic or a democratic approach. In the western democratic world, common ideology says that power with the people leads to stronger decision-making; that tapping into the intellectual resources of the people is better than a select few experts lead to better results (Mapuva, 2015). Regardless of this, several problems can arise as a result of participation. In the following section, some of the challenges and benefits of participation will be described.

It was made clear with the assistance of Robert D. Putnam that engagement on a broader level carries a plethora of benefits to society, but it is worth looking closer at the effects to urban design. First, the benefits; Cogan & Sharpe (1986) mention five distinct benefits to be found:

1. Information and idea sharing leading to a broader perspective
2. Increased public support for projects
3. Avoidance of protracted conflicts stemming from a poor understanding of what the people want from the decision-makers
4. The build-up of a reservoir of goodwill that can carry over to future projects
5. A spirit of cooperation and trust between the agency and the public

Only the first point speaks to the quality of the project itself, but that is also the critical point to participation; reducing the information-gap between decision-makers and the public to better utilise the knowledge of both groups (Cogan and Sharpe, 1986; Folscher, 2007; Marsh, Molinari and Trapani, 2013; Mapuva, 2015). The usage of knowledge from both groups is essential here, in the meaning that good public participation as such is not just the sharing of information to the public, but also not just to listen to potentially ill-informed opinions of non-specialists. The information has to go both ways, and so the process has to support strong two-way communication (Thiel and Ertiö, 2018, p. 204).

Interestingly the remaining four points all concern themselves with political advantages. This focus from Cogan & Sharp and various other theorists can likely be reduced to the simple fact that step one to participatory decision-making only can be taken by the decision-makers themselves, often politicians relying on public opinion. Despite this reliance, many agencies or decision-making organisations actively try to minimise citizen participation claiming it too expensive or too time-consuming (Cogan and Sharpe, 1986; Marsh, Molinari and Trapani, 2013). This is not to say such organisations seek to remove participation completely, that would be too bad for the public image, but if the involvement can be done in such a way that the extent of participation is limited to placation or lower on the ladder of participation, the chance of having to make changes to valuable projects is lower, and the process is assumedly faster.

The list of benefits is also a sign to those of the 'participation minimising' opinion that often the assumption that citizen involvement is costly and time-consuming is flawed. In the long run, both economic and financial gains from time-saving can outweigh the initial losses caused by allowing discussion of the project. While bad participation is often worse than no participation (Arnstein, 1969; Masser and Mory, 2018) and can cause both great dissatisfaction and costly delays, effective participation have the capability of achieving the opposite, with great reputational gains and better quality of results quickly recuperating losses of the participation process (Marsh, Molinari and Trapani, 2013, pp. 297–298).

Making citizen involvement effective

To bring comfort to decision-makers venturing into participation programmes, identifying some of the factors making the programs more effective can be identified, and focus on developing participation processes can then put on those parameters.

Reducing the isolation of the planner from the public and creating a freer conversation between the parties is one such way. While it can be time-consuming to be available for near constant conversation, it can also prevent having to redo pieces of design where feedback was collected too late, and it allows for the sharing of ideas as the ideas strike and their relevance remains readily available (Cogan and Sharpe, 1986).

Reducing this isolation also goes toward a different factor in making effective participation processes: Generating a spirit of trust and cooperation. Participants have to trust that their thoughts on the matter at hand are valued and actually makes a difference; the experience of participating

have to be rewarding, as coercive participation is known to have minimal effect (Mapuva, 2015). In processes driven by placation, the rung referred to earlier as the rotten rung, the efforts to reduce conflict by pretending to be inclusive end up putting active citizens in a situation where they are told they can make a difference but have all the information to know that nothing changes with their words. This is a generator of conflict, and so a time waster. Efforts should be made to show feedback is being used, as this not only gives a better end-product (as previously established by Mapuva, 2015) but also makes the whole process more effective rather than less (Cogan and Sharpe, 1986; Masser and Mory, 2018). This also means that assisting those in opposition to proposed plans in finding alternative ways to do a thing should be seen as valuable work. Rather than spending resources fighting a proposal born from citizen participation, the same time could be spent polishing that proposal, to be able to, by the end, compare the two standing proposals and use the best elements of both. That is a constructive use of resources, in opposition to both using resources creating the participation process and suppressing the results of it.

It has also been established that information is critical in this process. That goes for effectivity too, miscommunication and missing facts inevitably lead to invalid feedback, misinformed campaigns against design proposals and in the worst cases political scandals. Taking care to share information about the process and trusting citizens with the fact can significantly reduce the time consumption in the public process (ibid.).

The last point, but as important if not more so, is to be clear in what is being negotiated. When negotiating with citizens in a project, changes will be made to improve areas that the decision-makers might not have been thinking about and the citizens have a good idea for, but some areas can not be negotiated (Højlund, 2019). In urban planning, several building codes, planning regulations, environmental and historical asset protection laws limit the possibilities. On top of this, a sizeable capitalistic engine is behind most projects, requiring a profit to be made of a project, and so setting a minimum plot ratio in order to be able to convince someone to build the site. Beyond this comes technical knowledge, is the area prone to flooding, and how is this best solved? Such knowledge is highly specialised, and the typical public participant cannot provide a better solution than the specialist, and so the technical solutions may or may not be up for debate. Being clear on this, and so being clear on what is negotiable, saves much time, and helps explain to citizens why feedback on certain areas is not being heard, without estranging the citizen from the process.

To do these steps of effective participation, a good organization structure and transparent process of participation are necessary. Involving citizens is not a trivial task, it is highly valuable when done right, and so some effort should go into making the procedures to best achieve the effective and rewarding participation process (Mapuva, 2015).

(De)motivation to participate

Another problem with participation is one of motivation. Some points, such as making the experience feel rewarding, was mentioned in the last section and serves not only to make the process more effective, but also make it more appealing to consumers. To take it further, Marsh et al. call for a shift from participation processes being "information sharing" (which as illustrated earlier on the ladder of participation, it often does not even qualify as) to the next level: "Vision sharing" (2013, p. 297).

Citizens should feel that not only can they comment on the ideas presented, but they can produce their own ideas, their own visions for the area, and see some of this come to fruition. Marsh et al. call for recognition that if we are to call city planning a democratic process, the opinion of individual residents caring to engage should be evenly weighed, and so the vision of the individual is just as relevant when it comes to deciding the functions and general appearance of the plot.

Further, it is recognised that people engage more with their local environment than very large scale projects, even if the largescale project may affect them very directly (Carver, 2003, p. 64; Masser and Mory, 2018, p. 86). Motivating citizens on massive projects can be a lot harder, assumedly because understanding such scales is difficult even for professionals, and so quite a foreign concept for the average citizen. What is worse is that this lack of grasp for the broader problem on large scale projects can lead to an obstructivistic participation, otherwise known as the NIMBY-effect (Not In My BackYard). Here the primary goal for the participant is to convey a flat "no", instead of constructive feedback and nuanced consideration of whose backyard to best put the project in (Christie and Berger, 2017).

Another more practical issue keeping people from participating is that participation options still often are limited to public hearings (Carver, 2003). This particular analogue form of participation does not speak to everyone; while some want to be part of this, many others may never want to participate in that form. Too few or too poor other options are present for these people, and so they end up unengaged with the process. An apt analogy can be drawn to that of the slowly dying flow-TV format. In today's modern world the 'control-your-own-time' approaches of Netflix and Hulu, and the flow-TV adaptations like HBO and Danmarks Radio (DR)'s online streaming platforms are the preferred way to watch for many. The same issue will forever challenge public hearings (Carver, 2003, p. 62). It is at a specific location at a specific time with specific information presented in a specific way; it requires participants to schedule around going and dispensing with valuable free time in a stressed everyday life.

Making participation options more freely available and adhering to the previous advice of removing isolation between the public and the planner, may mean involving a whole host of willing participants, currently kept from participating by practical limitations.

Another group of people who may wish to avoid the analogue meeting are the unconfrontational people. Those who have been at a public hearing will likely have experienced how dissatisfaction with parts of plans are always present, and how feedback as such can be quite confrontational. As the planner responsible for Budolfi Square puts it: "*Of course some of the people who appears often have an agenda and raise critical questions. [...] often those who turn up, are also those with concerns in their hearts.*" (Højlund, 2019). The quieter population and those satisfied with how things are, may not wish to take part in this confrontational environment; and so, leaves the complaining parties with a proportionally larger voice. Finding ways to involve those seeking to avoid confrontation will as such allow a broader and more nuanced view of the public's opinion of a project.

Illustration 8: NIMBY illustration.

Participation in today's planning processes

In the following section, the current planning process of Denmark will be reviewed. The choice of the Danish system for comparison to a gamified process, can be narrowed down to two reasons: It provides a contextual basis to review the process of the development of Budolfi Square, and the Danish planning system is copied many places in the world, in part due to the Århus Convention, the first international law on, amongst other, participatory processes, based on the Danish 'Planloven' (UNECE, 2017). The section will briefly outline the legal requirements of planning agencies, and the main problem in the phrasing "public hearing".

According to paragraph 13 in Planloven, municipalities must create a local area plan (LAP) when substantial changes are made to an area, deemed to impact citizens living in or around the area. This is key to the planning process, as LAPs cannot be ratified before a public hearing is held. Further, if in the future a landlord wishes to build beyond the boundaries of the LAP, a public hearing for every required dispensation is required. (Erhvervsstyrelsen, 2018, paras 5, 12, 19)

This essentially means that unless building within pre-established boundaries for any given plot, the public has to be heard. It also means that a whole host of decisions have to be made for any built area before building commences, as there are strict and quite extensive minimum requirements to the contents of a LAP (Erhvervsstyrelsen, 2018, para. 6). As such citizens are from the beginning heard about issues such as materials, plot ratios, required pathways and so forth.

The boundaries for what is possible within a LAP are quite extensive, as long as they do not interfere with national and regional plans, the building regulations, and that the clauses of the LAP are legally enforceable (Erhvervsstyrelsen, 2018, para. 13).

It is often seen that the official public hearing is held near the LAP's completion. Reasons for this can be both good and bad from the earlier presented factors of good participation processes. On the one hand, this can lead to a more informed hearing, where citizens can in more substantial part see completed renderings rather than just sketches, and hear the full analysis of the area. Citizens may also have an easier time managing the process of commenting on an existing plan, rather than contribute to an otherwise blank slate. On the other hand, it allows decision-makers to present parts of a plan as inevitable, as something near decided, even if it could, in theory, be debated. It also allows for increased manipulation, precisely because of how finished the product is. With shiny polished renders and diagrams and a fully worked through narrative to sell this specific project, the unprepared citizen may have a hard time arguing against the plans. If the goal is co-creation, the involvement of the citizens will do well earlier in the process, where the plans for a site are less rigid and less expensive to change.

A fundamental distinction from actual participation does have to be made. Citizens are by law required to be 'heard'. They must be informed and consulted, step 3 and 4 on Arnstein's ladder, but only to the extend that their opinion can be expressed. Nowhere is it stated that these opinions have to be acted upon. In fact, the only way for a citizen to be able to stop a project if politicians are standing firm on the issue, is to complain if the above-mentioned process was not followed exactly as the law prescribes; and even then, it is usually just a do-over with the same project, a costly event, but not one that changes anything in the long run.

As such, unless citizens manage to get enough public support for a complaint, their opinion may well be heard, but nothing more is likely to happen, as decision-makers such as the plot owners, agencies and other influencers may have other interests in keeping the project on the planned track.

The potentially non-participatory nature of such a 'hearing' does not stop there, however. Utilising the manipulation step on the ladder, information may well be hidden in complex clauses and hard-to-read plans in the LAP, leaving participants uncomprehending of potentially essential elements of the LAP.

To top the capabilities of the law of, the very same system that allows agencies to ignore public requests, allows the agency to revert prior decisions if they are in disagreement with a citizen's utilisation of the LAP. With no prior warning, a municipal agency is always allowed to stop construction if the construction could be made illegal through a LAP, even if the current LAP allows it. In this case, the agency would just be required to produce a new LAP within a year that explicitly forbids the new construction (Erhvervsstyrelsen, 2018, para. 14). While the new LAP does require a public hearing, the process of stopping a project that society earlier explicitly allowed does not.

It is, with a basis in the above, worth considering if the otherwise much revered Danish planning law should be firmer? The legal complexities of requiring action from the results of hearing can understandably be difficult to formulate in such a way that the law does not obstruct more than it helps; but, the current law does create room for an empty yet costly charade of participation, where the process may as well have been skipped.

eParticipation

eParticipation offers many new options for ways to do participation and offers many improvements for citizens who have been unhappy or uncomfortable with current methods of participation. The following section describes some of these advantages and disadvantages, in an effort to shed light on what new can come from eParticipation.

There is currently an increased focus on participatory approaches in planning processes, but at least in some cases, these efforts may well be misguided; efforts made in the belief that people want to be more involved under the current system (Carver, 2003, p. 61).

Instead, a focus on newer methods should be employed; vastly different approaches from current methods. As described in the previous section, the current method of public hearings carry multiple problems in motivating citizens and is maybe not as effective as it could be. Participation tools have to be thought of differently, and eParticipation offers one such option.

eParticipation, the act of participating via the internet, typically through participants own devices, allowing participants to see and comment on design proposals from home at any given time of day, as it suits them. With the internet-based eParticipation participants can find the information they care about and respond just to that, instead of sitting through a meeting covering much more. Further participants can altogether avoid being confrontational and can be much more anonymous in their feedback, avoiding disregard from their local community if the community disagrees.

Looking at the ways to improve the efficiency of public participation presented earlier, it is clear that eParticipation offers a mean to achieve some of those steps of improvement with relative ease, providing a more constant and direct contact to planners and a better flow of information.

As will be illustrated in examples later in this chapter and the following, and for some of the reasons presented above, eParticipation is already being utilised with online surveys, social-media campaigns and information distribution on web platforms. The digital participation methods are still relatively new in their utilisation, and yet to be fully incorporated as a tool on level with the old analogue participation tool (Carver, 2003). This growth of use of eParticipation is likely to continue, as the growth of ICTs (Internet Communication Technologies) continues, and many municipalities are or have already developed their own platforms, yet often with poor results as the municipalities cannot keep up with the technological advancement and citizens lose track of the many changes (Thiel and Ertiö, 2018, p. 203). Citizen use of these technologies is, however, becoming easier, with the programs designed for such purposes getting more comfortable to navigate, and the requirement for highly specialised programs with complex user interfaces lessening (Steinmann, Krek and Blaschke, 2004).

Turning from some of the clear advantages, the grey areas and disadvantages of eParticipation must also be considered. First, there is the complicated matter of social inclusion. In today's modern world where most have access to the internet, regardless of financial and influential standing, eParticipation broadens the availability to participate in larger groups of people, especially inviting the have-nots to join in. However, the split between social classes moves to a split between digital capabilities. The digital divide between people will leave some unable or unwilling to use eParticipation, which may further marginalise this group as everyone else can participate. Ease of use is therefore paramount to limit this problem, and it would be best for inclusion to merely augment the current analogue toolset with eParticipation rather than replace it; though this does, of course, add more processing and so more costs to a project.

Another issue is trust. Already a big issue in citizen participation is that people have to trust the decision-makers to react to feedback, many find participating futile not believing it will make a difference (Laing, 2019, p. 51). It is not a stretch to imagine this feeling to be even more present and just as limiting to the participation process under a digital method. Here the users do not witness decision-makers reading their feedback, and so they cannot know for sure if they are heard or not (Carver, 2003). Citizens may well ask themselves "why should I bother?" and so never join in to make a difference.

Lastly, but importantly, eParticipation is a process that tends to start whether decision-makers want it or not. A problem with eParticipation, from the standpoint of the authority, is that it is much harder to control the process. When citizens can participate from home and in much larger groups, the space for manipulating the conversation and steering the discussions in the "right" direction is much more limited. While only select information can be released and it is up to the decisionmaker when the information becomes available and in which format, it is much less controllable how the information is interpreted and what happens as a result.

This is however better than the alternative for all parties involved, as multiple cases of citizen-started eParticipation have occurred in the last decade. Situations, where the agencies have provided no adequate platform for participation and citizens, have taken it into their own hands. While eParticipation may be hard to control in any case, such a process is entirely out of the hands of the decision-makers.

An example would be the story of the replanning of "The Blue Lagoon" in Trier, Germany:

The city council of Trier had voted in favour of a new uninterrupted circular bike path for the city. The petrol station known as "The Blue Lagoon" at the end of an alley impeded the project. A controlled public hearing was held regarding the removal of the station and creation of the new bike path made in its place. The conclusion of the hearing was generally positive. Now a few citizens did not like the idea, and so took it upon themselves to start an unofficial eParticipation process on Facebook, speaking for the preservation of the petrol station, with the lack of any other kiosks in the vicinity as the main argument. On Facebook, the few protesters presented the case as they saw it, and previously uninterested citizens would declare their support for the petrol station. Within long a massive movement of citizens was objecting to the plans.

City planners and other specialists would later shake their heads, exasperated, describing how the bike path would be a significant improvement to the area, and that unlike the path, a new kiosk could easily be placed somewhere else. A new kiosk was however never considered, the Facebook protest did not present the option, and with a city council election coming up, and enormous declarations of protest on Facebook, a majority of city councillors got cold feet and voted against their own plan. In this way, a major city transformation was halted by unintentional citizen control through eParticipation, despite advice to the opposite by those who held the information and were specialists in the field. (Masser and Mory, 2018)

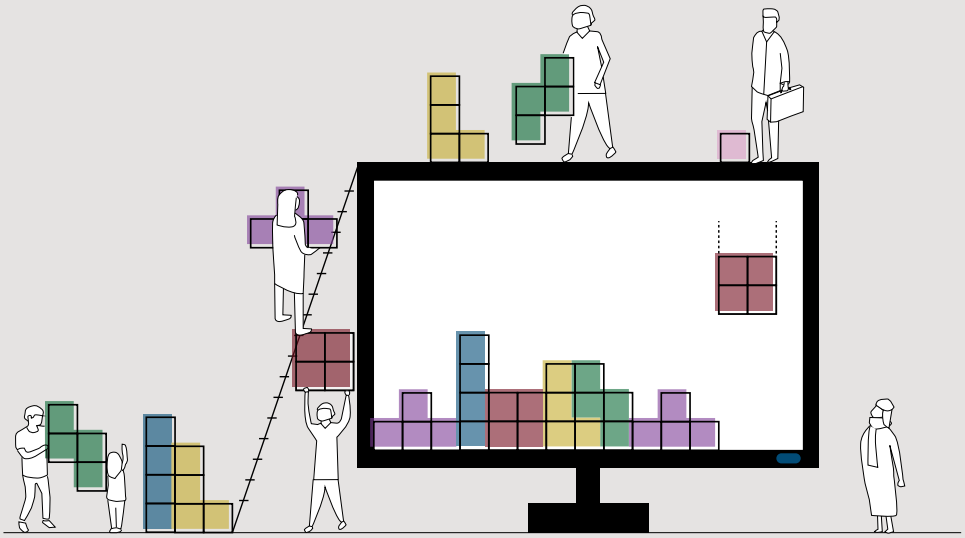


Illustration 9: eParticipation illustration.

Key takeaways and concluding remarks

The key takeaways from this section are:

- Civic engagement is important to society on many levels, this includes public participation.
- Participation can be subdivided into many categories. Arnstein's ladder will be used to differentiate the types.
- Public participation can lead to more informed and more popular developments.
- Reduced isolation of the planner and a stronger two-way communication flow makes participation processes more effective.
- Not everything should be negotiated through public participation.
- Various factors such as fear of confrontation and time constraints may keep some people from attending public hearings.
- eParticipation offers a way to include some of the above-mentioned people and offers a better information flow between decision-makers and the participants.
- eParticipation may deepen the digital divide between citizens.
- eParticipation is harder for the decision-maker to control.

Concluding remarks:

This chapter establishes that not only is civic engagement important for the health of a society, it is also not a given. It does not come naturally, and with no efforts to maintain high levels of engagement, it very much can wither away. One branch of this is urban planning, and how professionals in this field involve citizens in the decision-making process.

By calling for more participation, one has to address decision-makers prevalent concerns on the matter, namely the time consumption and financial costs. While a valid concern, looking at recent technological advancements, and the changes they have brought society, one can conclude that the landscape for this consideration is a different one from when public hearings were created. Information is widely accessible, and citizens can create their own quasi-participation processes online, via social media, if no such process is presented by the institution responsible. It could be argued that the choice has been taken away by progress, the question is not longer 'if participation should happen', as opposed to manipulative processes. Instead, the question becomes 'how it should happen'.

The current system only enforces non-participatory and slightly involving steps to be taken. As such it is up to the decision-makers to extend a hand to the citizens and make the participation process effective and rewarding for all parties involved.

Whether the involvement of citizens is done due to ideological or practical concerns, a controlled process with the decision-makers at the head of the table should be sought, as not to let the process run wild as it did with the blue lagoon. Achieving this is only possible by creating a table that citizens both want to and are able to sit by. Information has to be conveyed in a way that is equal to the time we live in and presented in a way that matches the way we live. For some, this is the conventional way, for many, in particular, younger generations, it is not. New methods have to be employed, and the process developed to suit societal advances brought forth by the leaps in technology in the past few decades.

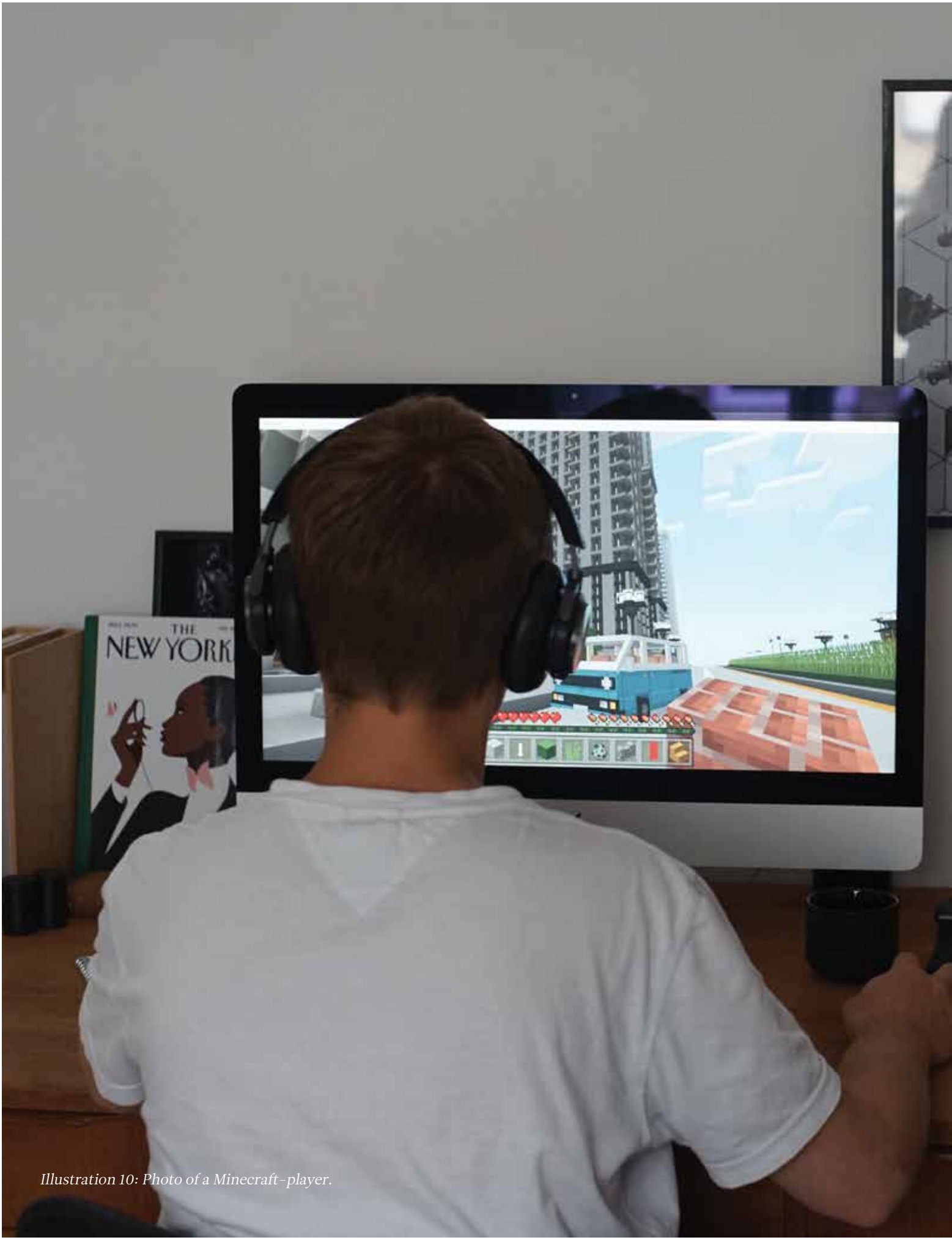


Illustration 10: Photo of a Minecraft-player.

Gamification

Following up on the introduction's preview of the topic of gamification, this chapter seeks to further unfold the topic through a reading of existing theory and a look at existing examples of gamified participatory processes.

There are 2,5 billion gamers worldwide, a number that has seen rampant growth over the last decade, approaching 3 billion players by 2021 (Statista, 2019). As such, games play a substantial role in today's society, and the ability to abstract information from various game-types is becoming innate with children and young people. Further, the high usage of games suggests that using games to convey serious matters, may be a simple way to motivate people to invest time into the topic.

First, the chapter investigates the terms 'gamification' and 'serious games', and how researchers on the field disagree on the exact difference. Then the chapter briefly covers the most basic of game mechanics models, to understand what makes a game.

From this core understanding of games and gamification, the chapter can continue to investigate the uses of gamification in urban planning and for creating spatial understanding and collecting feedback through games, something the world has seen a blossoming of in the past decade (Haahtela et al., 2015). Examples number the Climate Hope City project commissioned by The Guardian as part of their climate campaign, an effort to reimagine the city in games (Stuart, 2015); and the recreation of Great Ormond Street Children's Hospital by Shapescape and the hospitals VR department, meant to give children about to be hospitalized a spatial understanding of the hospital before going, and so reducing anxiety and stress about the ordeal (Shapescape, 2019).

The chapter ends with a meta-analysis confirming theories that games motivate participants, and finally, the chapter looks into the importance of interactivity, and why the same can not be achieved with a simulation as can with a game.

Gamification or serious games?

First step in looking at the effects of gamification, is to know what gamification is and its relation to the term 'serious games', which will also see use throughout this thesis. The following section seeks to describe this difference, and to show how prominent theorists in the field disagree on how the terms should be used, with some arguing for their interchangeability and some for the complete separation of the two concepts.

In the introduction, the definition of gamification is provided as "*adding game-elements in a non-game context*" (Thiel and Ertiö, 2018). That particular definition has the consequence that serious games, earlier described as games with the purpose to support functions outside the game in a non-entertainment domain, cannot be gamification.

Thiel and Ertiö's definition has its strength in its simplicity, however, Karl Kapp, an expert in learning organisations and educational technology, argues that it is a narrow-minded way to see gamification, a definition that "*does not lead to learning, engagement, or productivity improvements*" (2012, p. 15).

Instead, Kapp defines gamification as follows:

> ***"Gamification […] is a careful and considered application of game thinking to solving problems and encouraging learning using all the elements of games that are appropriate."***
>
> (Kapp, 2012)

This broader yet more specific definition allows for serious games to merely be a subcategory of gamification. Most gamification is, as explained in the introduction, the adding of game elements to further engagement or learning outcomes to real-world situations; for instance, according to Kapp, when a company like IBM teaches its employees the complex idea of business process management through their own interactive first-person thinker game by the name of INNOV8 (Kapp, 2012, p. 20). This is important because it means to general theory applying to gamification and its subcategories also apply to serious games. It further matters to realise that using actual games for educational and similar purposes can be just as valid as taking elements from the games and applying directly to how the same content was taught before; that all depends on which tools best serve the particular purpose. (Kapp, 2012)

This line of argumentation seeks to dismantle the stigma that games are not a serious medium and is ill-suited for serious matters. The following quote segregates the entertainment-focused act of playing, and structured way of acting that is a game:

> ***"Playing—or "paidia"—refers to the free form, expressive, improvisational manner of playing. Think of children playing in a playground, youngsters creating nicknames for one another […]. Gaming—or "ludus"— refers to playing structured by rules and a competitive strife towards a defined goal. Think of a football game or a computer game like SimCity."***
>
> (Devisch, Poplin and Sofronie, 2016, p. 84)

Users can play a game for enjoyment, but they can also learn from a game, or use a game to achieve a specific goal; just as a book might be read for enjoyment, used to guide your cooking or to learn all the newest knowledge about knitting. Games may be quite serious, and so the word "playing" be quite out of context in relation to the game, an example being the game of politics, with wide-reaching and serious potential consequences to not playing by the rules or to simply outplaying your opponents.

This definition of gaming also provides a solid base understanding of why gamification may be a strong tool for participatory processes, just as it is in learning. Gaming is at its most basic a ruleset for participants to follow. Not everything is possible, some limitations are laid down, but at the same time, the participant is invited to explore the boundaries of those rules, think for themselves and find how to best reach their goal within the frames provided.

The term gamification, and it could be argued its subcategory serious games, is further unfolded by Tara J. Brigham as follows:

> ***"Another way of thinking about this difference is to recognise that gamification is often used to advance goals outside the context of a game, such as the goals of a greener or healthier living. […] gamification is not a self-contained unit; it does not have a clear beginning, middle or end. Gamification uses game-based elements and strategies to increase engagement, motivation and learning, and even solve problems."***
>
> (Brigham, 2015)

By those words, gamification and so serious games do not necessarily end. Unlike a typical entertainment game that much like a movie goes through one story arc and then ends, games are able to be tied to ongoing real-life processes, to motivate not only the playing of the game but also engagement into the process in a broader sense.

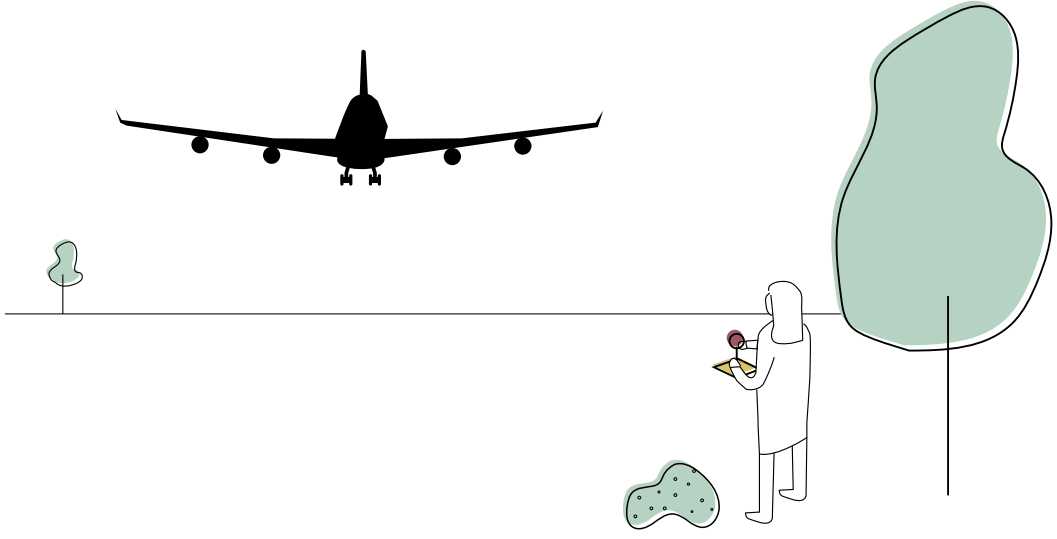


Illustration 11: Serious gaming illustration.

Gamification in citizens participation

Laing states that in the coming years, new development plans, new methods of designing and visualising will increasingly be done by non-experts; the results will be used in the planning and design process seamlessly (Laing, 2019, p. 7). If that statement is to hold any truth, a key step is providing non-experts with tools they can manage. The average citizen is lost in programs like Revit, clueless on how to navigate through Rhino and lack the mathematical know-how to create curving surfaces with tools like Grasshopper. What an increasing percentage of the population can do is play digital games.

Researchers Thiel and Ertiö support Laing on this, but also stating that the digital divide in user groups is lessening as society's understanding and access to digital tools expand (2018, p. 206). They also emphasise that those most hampered in the usage of digital tools, the elderly, are the same as those who most often participate through conventional means. The following quote illustrates why this is not the group that should be the target of new methods, and why a gamified method targeting those not usually participating might be a strength:

> **"A common understanding is that involving diverse groups of citizens yields better plans. This statement lies on the assumption of crowd intelligence, postulating that large and diverse groups of individuals outperform small groups of experts. Again this implies that e-participation platforms succeed in engaging a broader population, hence going beyond the 'usual suspects' of public participation. For this gamification might be a promising approach."** (Thiel & Ertiö, 2018, p. 206)

This is supported by their later findings (p. 226) when testing their custom 'Täsä" app developed for an area in Finland, where findings would show that increases in motivation were mainly found with those already affined to digital games.

Brigham further supports this but argues that Generation Y, in general, is capable of drawing benefits from gamified participation, as their affinity to digital technology is good enough to be able to comprehend games, even if they are non-gamers (Brigham, 2015).

This only goes to embolden that gamification in public participation processes should be seen as a tool in the toolbox next to older analogue methods, and not as a replacement. Considering the ever-increasing amount of gamers, and the shift of generations to a more technologically adept the need for the new tools will only grow bigger. However, even when focussing on younger generations, the elderly should not be discounted. When Poplin tested her game 'B3', she found that ***"elderly people were enthusiastic about learning their environment and especially about learning in a new, game-based way."*** (2011a, p. 12).

In other words there is some doubt in the willingness for the elderly to participate in such a way, and it may be argued that it is highly dependant on the way the method is presented and how much help is provided to participants. There does not however seem to be any doubt about younger generations ability to participate by such means, in particular, those already experienced in gaming.

Earlier it was presented how Thiel & Ertiö had found the aspect of "fun" not to be the driving motivator behind getting people to participate. However, some disagreement between theorist remain here, with Poplin having coined the term 'playful public participation' (PPP) and stated that:

> "*Our research is based on the assumption that playfulness and games can potentially address the issue of rational ignorance by attracting more people to participate in and learn about urban planning situations.*"
>
> (Poplin, 2011b, p. 196)

The exact answer remains unclear and probably is to be found somewhere in between. For the participation process to be a genuinely fun experience surely cannot be a bad thing, even if people may well be motivated by other elements than just that of entertainment. The result is that games used for this purpose do not necessarily have to be as fun and internally rewarding to play as pure entertainment games.

Illustration 12: Citizen using gamification.

The interactive experience

One of the great differences between simulation and gamification is that gamification is interactive. Unlike simulation tools that seek to mimic real-world situations as precisely as possible, games intentionally simplify situations to only contain the elements that the player should concern themselves with (Kapp, 2012, pp. 26-28). This abstracted reality, while less precise, has some advantages over reality. It helps the player, or participant, to manage the conceptual space being experienced; by working in an environment of reduced complexity, fewer skills in the field are required to make changes and impact the environment. It helps the player understand what is going on (ibid.). As Kapp puts it:

> ***"Imagine trying to duplicate all the complexity of running a major city, creating an amusement park, or gearing up for a military assault. These are involved and complicated processes and the backdrops for a variety of engaging and fun games. Games based on this complex subject matter work, not because they include all the complexities, but precisely because they reduce the complexity and use broad generalisations to represent reality. The player is involved in an abstraction of events, ideas and reality."***
>
> (Kapp, 2012, p. 26)

Another advantage is that the reduced complexity helps identify cause and effect. Reality is messy, and for the layperson being part of every minute detail of task is not necessarily fun or productive, but it is time-consuming (ibid.) By removing elements of reality, the player can better focus on what matters and can grasp the game mechanics and dynamics quicker.

The last benefit worth mentioning, although not directly translatable into better participation, is that elaborate, detailed 3D games and highly complex systems are expensive and time-consuming to make (Kapp, 2012, p. 167). To keep it feasible to use games for participation, the game either must be simpler, or the complex, detailed game has to be so well designed that it can fit across many complex situations and so see repeated use.

To summarise, the benefits of abstracting reality are that the player is better and quicker able to interact with the game. This is important for the whole gamified participation process, as it has, in the previous chapter, been established that two-way communication is essential for good participation; and, one of the benefits of games is its ability to allow players to convey spatial thoughts within the games simplified environment. The usual other eParticipation means through social media, and online fora allow some two-way communication, but just as the analogue dialogue it requires both parties to be able to communicate forms and shapes in a way the other party understands. The recent rise of gamification in city development, exemplified in the prior section, and the starting research of gamification can in large part be justified by the interactiveness and availability to non-specialised users (Thiel and Ertiö, 2018, p. 204).

In projects where strong participation is the goal, and some measure of co-creation between the agency, citizens and other stakeholders is supported, interactivity is a necessity. The model on illustration 13, dating as far back as 1986, compares interactive planning with conventional planning. Thinking back on what was learned about different degrees of participation, it becomes clear that interactive planning in the eyes of Lang is very closely aligned with co-creative participation, at least on the partnership rung of the participation ladder.

Interactive planning	Conventional planning
- Includes feedback, colsultation and negotiation	- Limited feedback; maybe some consultation
- Interaction occurs early on and throughout the process	- Early interaction with implementers only
- Assumes open participation leads to better decisions	- Assumes better information leads to better decisions
- Planner as value-comitted advocate	- Planner as value-neutral expert
- Focuses on mobilisation of support	- Focuses on manipulation of data
- Plan = What we agree to do	- Plan = What we should do
- Success measured by achievement of agreement	- Succes measured by achievment of plan's objectives

Illustration 13: Interactive vs conventional planning. Made with inspiration from Lang (1986, p. 39)

Game structure

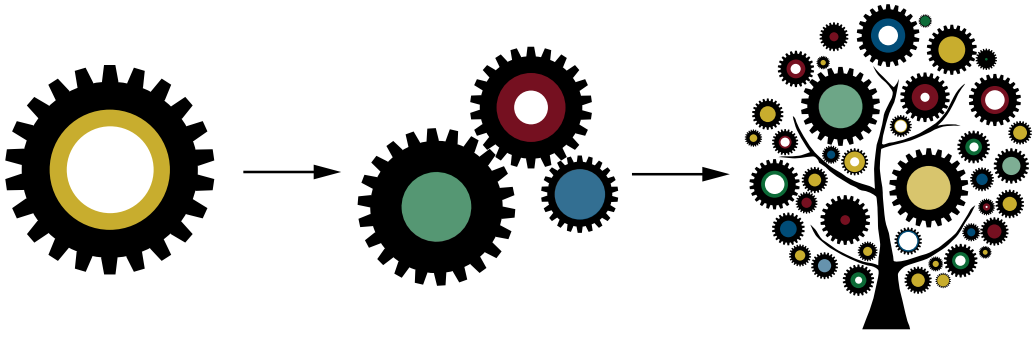


Illustration 14: MDA model.

To look at how games engage people, the MDA (Mechanics – Dynamics – Aesthetics) model by Hunicke et al. (2004) will be used. Good games in general, but also good gamification of urban design (Schnabel, Lo and Aydin, 2014, p. 2), should instrumentalise all three elements effectively and with a natural progression from the first to the last, experienced in opposite order by the player.

In brief and illustrated on illustration 14, mechanics, describes the particular components of a game at the level of data representation and algorithms. These enable the dynamics, the run-time behaviour of mechanics acting in unison and with inputs from the player. This ultimately leads to the aesthetics of the game, in this case describing the desired emotional response from the player, as the player interacts with the dynamics. A simple, although less precise, way of representing the model would be to rename it as RSF: Rules – Systems – "Fun" (Hunicke, LeBlanc and Zubek, 2004, p. 2); at least this representation would work for the ordinary entertainment game. The model describes aesthetics as the driving motivator for playing, and proceeds to narrow the motivator down to fun, or rather various methods of achieving "fun".

In gamified participatory processes, it has however been found that while "fun" can certainly be appreciated, that is not the goal of the player. Instead, being invested in one's local environment and the ability to voice one's own opinion are the driving motivators (Thiel and Ertiö, 2018, p. 226). As such the aesthetics, the desired emotional response sought in players is one where they feel involved and able to express their spatial desires to the given space, meaning the dynamics should afford this feeling and the mechanics centre around allowing such systems. In the case of gamification, the knowledge that needs to be taught or extracted from the player has to define the design techniques and game mechanics used in gamification (Kapp, 2012, pp. 166–167). This disqualifies the vast majority of games, which may well be fun, but not be suitable for achieving that sense of involvement sought by participants in planning processes and not able to extract the knowledge that should be the outcome of the process; which allows omitting such games entirely from the following case-study of different platforms. It also gives a goal by which to measure different games and their capabilities.

Examples of gamification

To further qualify this study, it is worth having a look at some key examples of what gamification has been used for already in creating spatial understanding and involving citizens in urban design processes. A few examples were named in the introduction to this chapter, but in the following section, some of those along with other examples will be described, in order of showcasing what gamification has already been part of achieving.

Illustration 15: Photo from Nairobi project

Illustration 16: Screenshot from Crowdsourced Moscow.

Works by Block by Block and UN-Habitat

Block by Block has, in collaboration with UN-Habitat, been part of over 300 participatory projects using Minecraft to empower citizens with a design method and language for changing public spaces in their neighbourhood (BBC Technology, 2012; GamesforCities, 2012). The game is used to involve poor communities in the design of their own public spaces, inviting citizens to design the area over a series of workshops. The choice of using games, and Minecraft specifically, was made because of its ability to allow visualisation of urban planning ideas without any architectural training (GamesforCities, 2012; Block by Block, 2017).

The program was piloted in Nairobi, allowing the locals to design their own playground in the village of Undugu; plans that today has been realised (Block by Block, 2017). As such this is an example of co-creation in 3rd world countries, with a participation process very high up on the participation ladder.

Crowdsourced Moscow

Andrei Goncharov developed a top-down social media game, allowing citizens to make their suggestions for improvements across the whole city. Players could then vote and spend the in-game currency to promote other player's proposals further. The idea was to reduce a growing discrepancy between what the public agency decided to build and what the people wanted (Goncharov, 2011).

The game, for instance, led to an extensive battle between players voting for different proposals on how to best utilise a big courtyard on the outskirts of Moscow. The buzz around the site drew planners attention to it and inspired by the highest voted suggestions they would initiate the process for a new design for the courtyard, increasing walkability and adding some facilities to the site. The end result showed 20% more walking and 30% decreased the crime rate. (Goncharov, 2011).

Illustration 17: Render of GOSH project.

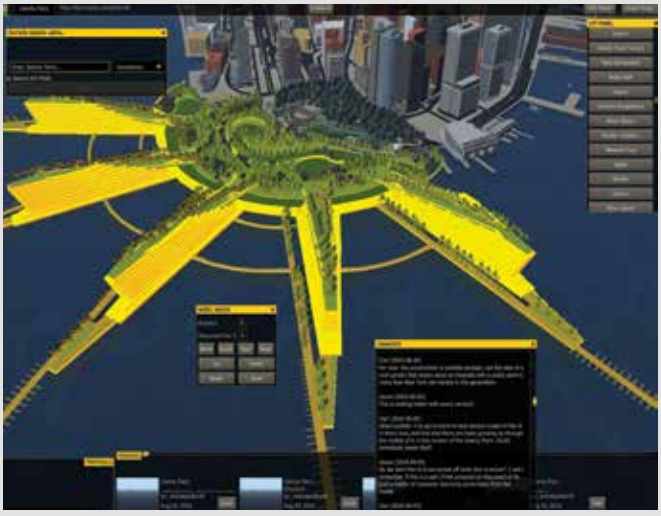


Illustration 18: Screenshot of Betaville.

Great Ormond Street Hospital

A second Minecraft project with a different angle is the recreation of Great Ormond Street children's Hospital by Shapescape. The hospital already had numerous VR-experiences to ease and provide information to the children about various procedures but was continuously faced with the issue of general fright from the children (Lipscombe, 2018; Shapescape, 2019). Children ill enough to have to live at the hospital for a while have lots to fear, but often their number one concern would not be the illness itself or any operations following, as those can be hard to grasp for a child's mind. Instead, the notion of living at a scary hospital would haunt their nights.

This project by Shapescape has been launched online, to allow all future patients to discover the hospital in Minecraft, and would from this achieve a spatial understanding and mapping of the hospital, allowing them to find their room, their doctors office and various facilities without having been at the hospital even once, making the complex building a lot less scary (Shapescape, 2019).

Betaville

Developed by Carl Skelton and Skye Book, Betaville was used in New York to provide a platform for interactive discussion of new city developments, accelerating informed decision-making for early-stage ideas in the city (Games for Cities, 2011).

Taking inspiration from open-source software development, the game utilises broad participation to form and shape the city and works off feedback provided as sticky-note forums posted in the three-dimensional space. The program does require users to upload 3D models made in other software, but by allowing this merging of a multitude of people's models, citizens become able to view a plethora of design solutions to different spaces, comment upon them and discuss which one is best.

Illustration 19: Render of Future Florence project.

Future Florence for Children

The last example from Minecraft, down the same alley but at a larger scale than the Block by Block projects is another recreation by Shapescape. During the yearly "Kid's Week" in Florence, the Florentine Museum Association one year held the theme "Future Florence". Part of this was to allow children to express their wishes for their future city.

At Museo Novecento the recreation would be exhibited for a period of time, allowing the children of Florence to navigate the world and make their own additions to it. (Shapescape, 2019)

Further, the recreation is used to educate about the Florentine history and showcase historic buildings and street layouts (Vigelini, 2017).

Illustration 20: Screenshot of Cities: Skylines.

Cities: Skylines in Stockholm and Hämeenlinnaa

In both Stockholm and Hämeenlinnaa, the interactive city simulation game Cities: Skylines have been used to invite residents to make their own suggestions for developments of new neighborhoods (Haahtela et al., 2015; Wakefield, 2017). Having had recreations of the cities created for the purpose, each municipality would invite citizens to download the model of the city and make their own changes to it. Reuploading their modified models with their own comments, would let city planners see how the residents thought land use and street layout should be in new development areas.

This example is interesting because it utilises a large scale game, simulating entire cities and all their infrastructure; and yet, by using the gamified version, they managed to get citizens to grasp the complexity and make their own contributions.

Meta-analysis

In this table a meta-analysis is done to utilise the how gamification can contribute to learning methods. Furthermore, studies investigate the difference between the conventional methods versus interactive simulation teaching. The different existing studies and experiments are concluded in key findings which can subsidise to the understanding of existing studies done in the field of gamification and learning. This overview contributes the understanding of what research is already done in order to kickstart this thesis. The primary literature is about gamification and learning and the last source is specific about public participation in urban planning, both topics are relevant to this thesis in order to understand the findings of how the digital environment have an impact on people. The meta-analysis is partially based on Kapp's work (2012).

Name of meta-analysis	Year	# of studies examined	Key findings
The effectiveness of games for educational purposes: a review of recent research (Randel et Al, 1992)	1992	67 studies in a 28 year timespan.	56% of studies showed non or little difference between conventional and gamified learning methods. 32 % showed a favoring of games, while only 5% favoured conventional methods.
			Games are consistently rated as more motivating and more interesting than conventional methods.
The effectiveness of business games in strategic management course work (Wolfe, 1997)	1997	7 studies in a 22 year timespan, all using one treatment group and one control group.	Game-based approaches to management coordination produces significant increases in knowledge-level compared to conventional methods.
The effectiveness of instructional games: A literature review and discussion (Hays, 2005)	2005	105 studies providing empirical data on the effectiveness of instructional games.	Exisiting research is fragmented and suffers from methodological flaws and poorly defined terms.
			Research consistently shows games can increase cognition when used in the right situation, it is undefined what the right situation is.
			There is no evidence to support that games are always an effective means of instruction.

Name of meta-analysis	Year	# of studies examined	Key findings
Computer gaming and interactive simulations for learning: A meta-analysis (Vogel et Al, 2006)	2006	32 studies that all identified cognitive gains or attitude changes in their hyptheses, and provided satistics assesing conventional methods vs interactive simulation teaching.	**Cognitive gains was found to be higher in those learning via interactive games or simulations.**
			Subjects were more motivated to learn through games compared to traditional methods.
			The level of picture realism does not seem to have any impact.
A qualitative meta-analysis of compute games as learning tools (Ke, 2009)	2009	89 studies. The meta-analysis is a qualitative review of the studies.	52% of the time a significant positive effect was found with game use instead of conventional learning methods. 25% of the time the results were mixed, 18% of the time no difference was found and only in one study the conventional instruction was found to be better.
The Gamification of Civic Participation: Two Experiments in Improving the Skills of Citizens to Reflect Collectively on Spatial Issues (Devisch, Poplin and Sofronie, 2016)	2016	2 studies of specifically urban planning games	Games can support durable civic engagement.
			Depending on the structuring and utilisation of games, they can both be used for manipulative and non-participatry means, and for co-creation.
			Games motivate citizens and makes participating more fun.

Key takeaways and concluding remarks

The key takeaways from this section are:

- The amount of gamers in the world is rapidly increasing.
- Users can use games to learn or achieve real life goals
- Serious games do not necessarily need to be fun, as other parameters can motivate players.
- Gamification has already seen use across a number of city-planning and spatial understanding projects.
- Urban design will increasingly utilise non-experts as part of the design process.
- Participants need simpler tools to convey spatial ideas.
- Interactive user involvement allows two-way communication to rise beyond just the written or spoken word.

Concluding remarks:

The concept of gamification through digital games is relatively new, and not all that well recognised by professionals in a field such as urban design yet. The entire topic carries some stigmatisation by being centred around computer games, a thing usually not perceived as anything serious. On top of this, and maybe, as a result, the field has seen relatively little research, in spite of how significant a role games play in our societies daily life.

Those who have researched the matter; however, they carry no hesitation when speaking to the potentials of the field. The exact capabilities of gamification to enhance understanding and motivate participation remain unknown, especially in urban design; but the limited testing that has been done clearly shows a trend toward significant upsides. Interactivity plays a crucial role in motivating participation, in making subjects feel they have a good basis for input, instead of just commenting on what appears as a finished product in a simulation. This is true to the extent that detail and the complexities of realism may even hamper understanding more so than enhance it.

This potential has only been embraced half-heartedly, with researchers from the field of participatory urban design, having focused almost solely on custom-designed games, made to fit perfectly to any given project. Results have been mixed, with participants garnering a new understanding of the project, but feeling foreign and hesitant towards the platform. On top of this, the whole idea has been wholly unrealistic, as the development of such games is way too expensive for it to be a sustainable way to do participation.

Combining findings that realism is less of a critical factor than first anticipated, with the results of attempts with custom games, a much more approachable way is revealed: The use of existing games, not specifically made for one site, but instead flexible, able to be used for nearly any development. This is only confirmed by reality; as it so happens, that usage of gamification using exciting games is already well underway multiple places in the world. Regardless of limited research, the method is being applied with success in multiple areas requiring spatial understanding from non-specialist, and so the time for formalising this usage into urban planners participatory process is right.

Colcluding remarks from theory chapters

Based on the findings so far, it is clear that there is both a group of society left out by the current means of citizen involvement in planning processes, and that those who do participate may be exposed to the information in a way that is difficult for them to fully grasp, and so give feedback too. With the knowledge that citizen engagement is vital to the health of society and that urban environments are both more popular, well-used and with a much lower risk of scandalization and delays when involvement is appropriately done, the arguments for good participation, borderline co-creation, becomes clear.

Couple this with a new growing field of digital gamification; something that has already seen great repeated success, but only a little research, and it becomes apparent that investments into further exploring this topic are necessary.

Early indications show that gamification may exactly help improve spatial understanding of developments in participating citizens, enable citizens to give feedback more useful to decision-makers and motivate more citizens to involve themselves; both by using a platform they know and understand, and by allowing participation from the comforts of the home in one's own time. In other words, solving the key issues with participation mentioned above.

While it would be naivë to believe no challenges and problems to arise and follow the use of gamification, it would be at least an equal mistake not to investigate the topic further, both academically and practically by continued attempts at using it in real participatory processes.

Based on this conclusion, this thesis will dive deeper into the use of an existing game as a participatory tool, to investigate the potential for this platform to be a viable and sustainable addition to the participatory toolbox.

It is the hypothesis that public participation processes can be improved for non-specialists in Generation Y through existing games, providing both ease-of-access, improved spatial understanding and better means of feedback to the decision-maker.

Main objectives:

- Test if gamification can be utilised to improve spatial understanding and motivate more participation in non-specialist citizens.
- Investigate if gamification is a feasible method of participation for the decision-makers in terms of costs and administration.
- Synthesise findings into a set of guidelines on how gamification is best utilised by the decision-maker.

Example of gamification

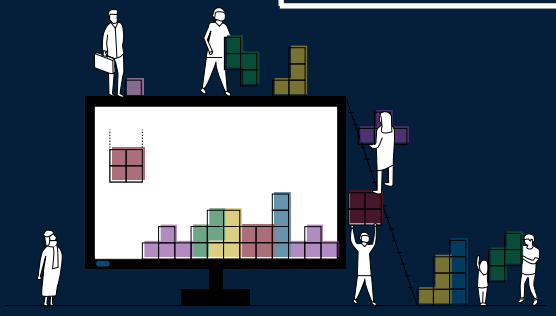
The game is used to involve poor communities in the design of their own public spaces, inviting citizens to design the area over a series of workshops.

Participantion

Generation Y
is the focus

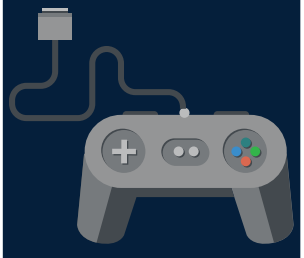
Interaction planning
conventional planning

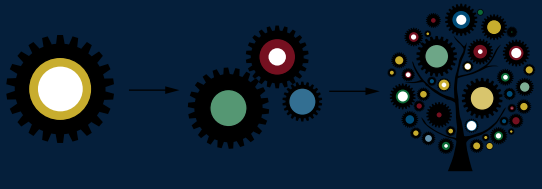
eParticipation



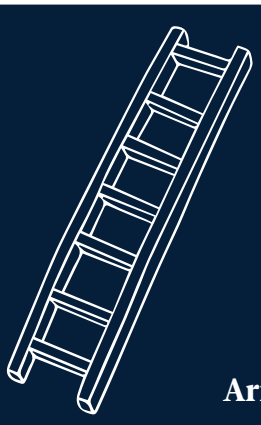
Gamification

"***game elements in non-game contexts***"
(Thiel and Ertiö, 2018)





"The idea of citizen participation is a little like eating spinach: no one is against it in principle because it is good for you."
(Arnstein, 1969:216)



Arnstein's ladder

Illustration 21: Theory summary.

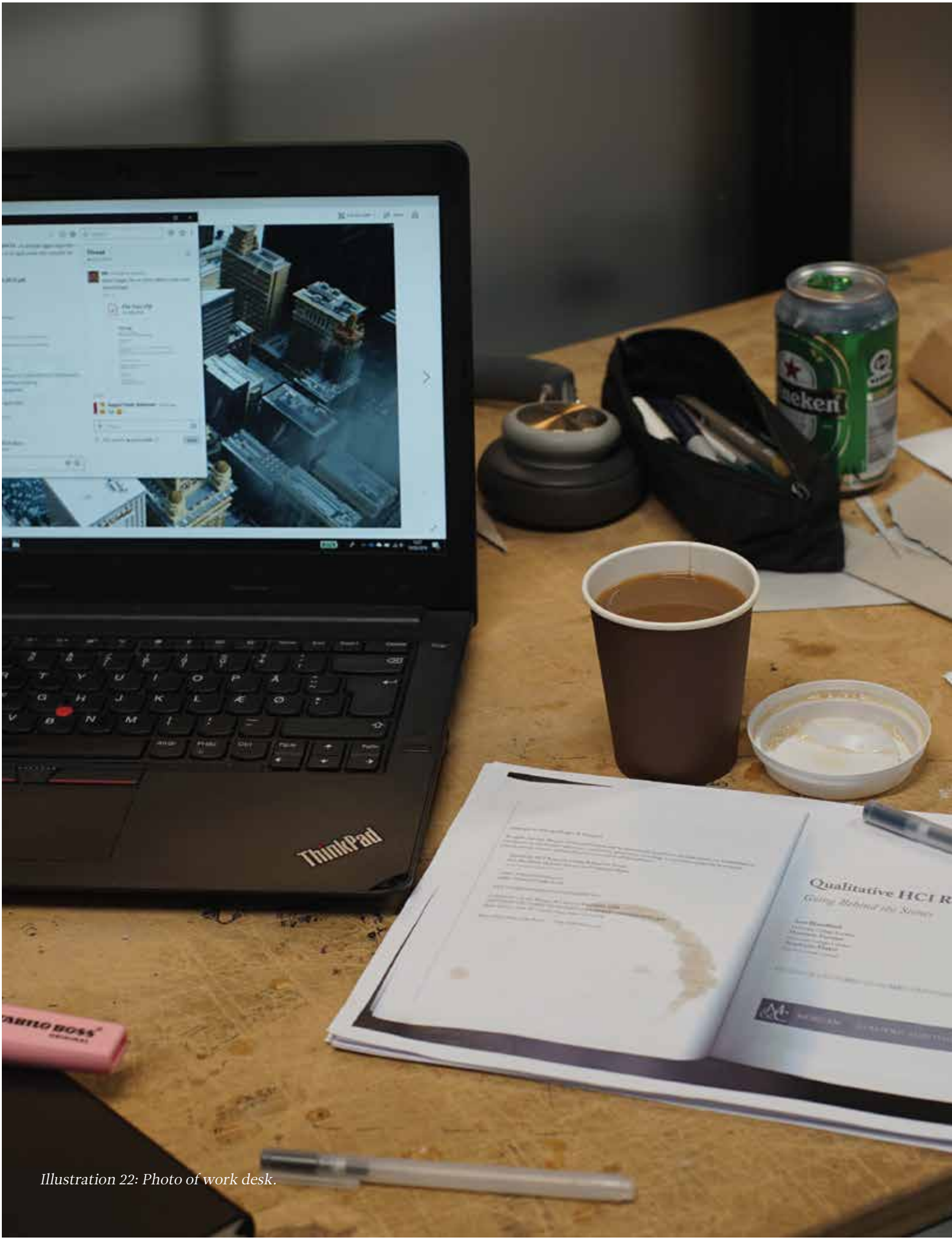


Illustration 22: Photo of work desk.

Methodology

The following chapter contains a description of the different methods employed throughout the thesis and how they were utilised in this thesis. The chapter will, in essence, lay out a map of how different sources of knowledge was planned and eventually used to arrive at the answers to the previously posed hypothesis and to produce a booklet guiding decision-makers on gamification for future participatory processes.

The chapter will both look back at the already presented theoretical review, and present the intended use for this knowledge going forwards, and how the resulting hypothesis can be tested through a series of semi-structured interviews, supported by case-studies of existing games that could conceivably be used for participatory means in urban design. Furthermore, the chapter presents how the interviews will be analysed, along with the arguments for why this is the best method in this case.

The chapter does not add further to the theoretical knowledge, nor does it directly add to the production of the booklet. The chapter merely seeks to outline the structure by which the product will be created, in order of validating its design by rooting the process in the acquired information.

Theoretical review

As already presented and concluded upon, the first step of this thesis was to do a broad reading into participation theory, in particular, that of eParticipation along with a similarly broad reading of theory on gamification in urban design. Additionally, a very brief surface investigation of how spatial understanding is affected by virtual presentations of space was conducted, although in this case only to a shallow extent.

The choice of fields of theory to investigate: gamification, serious games, participation (including eParticipation) and some spatial cognition; was based on the initial research questions. This first part of the thesis was not only fundamental to provide an understanding of both what is known or at least theorised about participation and gamification already, but also to identify gaps in knowledge and what might be most rewarding for this thesis to investigate.

> **"You might provide a summative or integrative review. This would involve summarizing past research and making recommendations in how your research will be an addition to the existing stock of evidence."** (Hart, 2018, P. 19)

The literature review so revealed the lack of research into existing games, with prior research focusing on custom games; this knowledge allowed the setting of final research goals and formulation of a hypothesis for testing. Through this, the ongoing efforts could be narrowed down and focused on achieving a deeper understanding of the selected topic.

Further, the theoretical review serves to allow for later validation of results, or alternatively, in the case of a conflicting result, the identification hereof and reflection on the cause of this conflict.

To validate the conclusion to the combined theory, professionals in the field of digital visualisation were consulted. The interview was semi-structured and relatively informal to allow for unknown unknowns to be revealed. The physical presence at Arkitema Architects also allowed for the testing of the capabilities of their VR tools. Interview can be seen at appendix 02, QR code 03.

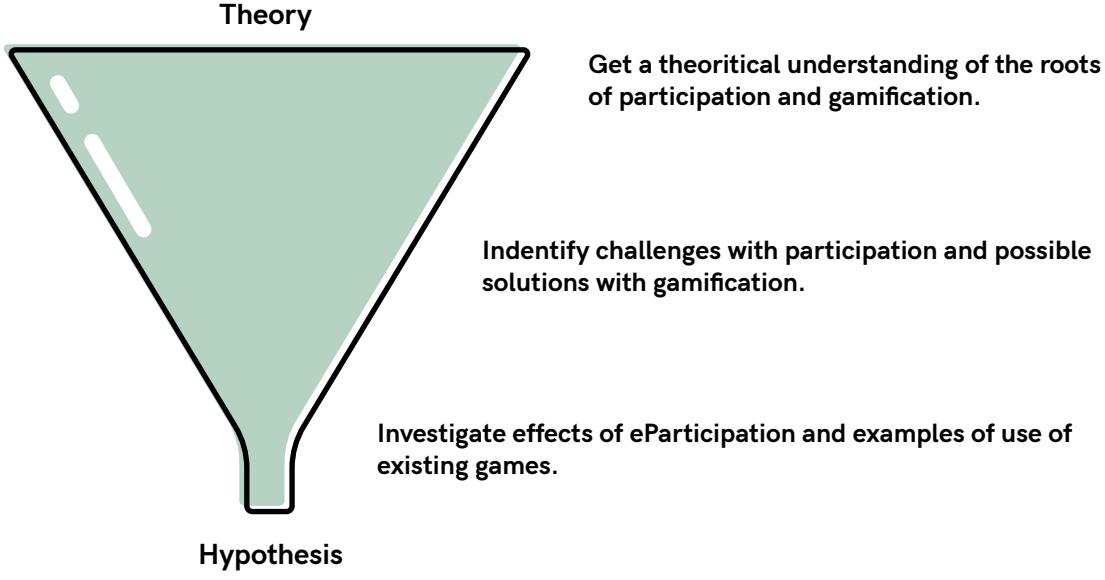


Illustration 23: The literature in one diagram – narrow down

Case-studies

With only very few words in the literature on the capabilities of existing games, a case-study of such platforms have to be conducted to give insight into the various games and what elements of a participation process they do and do not afford. Ultimativeley these studies should lead to a table of comparison, allowing the identification of the best game to test in this thesis.

To understand case-studies as a method a clear definition is essential:

> **"An empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used."** (Yin, 1984, p. 23)

The challenge, in this case, will be that the games sought investigated were intended for an entertainment use, and so will see use outside their usual context. The case-study will therefore mostly be one of mechanics and dynamics of the game, along with a general review of the type of game, rather than a review of how the game works when practically applied to participation. It will be an investigation of the limitations and rules the game set for the player, along with the options that remain available. Most of this information is gathered through actively engaging with the game.

Combining experiences and information gathered by playing the game with knowledge on the game-systems is what allows a full picture to be drawn of the game. This is why case-studies serves as a good method to accomplishing this, as one of the great advantages of case-studies is how it allows the coupling of qualitative and quantitative data, as Winston Tellis explains:

> **"By including both quantitative and qualitative data, a case study helps explain both the process and outcome of a phenomenon through complete observation, reconstruction and analysis of the cases under investigation"** (Tellis, 1997)

Case-studies as such allows to comprehend the complexities of a full game by not simplifying the game itself, but instead try to extract more straightforward metrics by which to judge the case against others (Gade, 2019).

The selection of cases will be based on picking games that in different genres, that all may align with the requirements identified through theory, primarily the parameters: availability and recogniceability for the user, the possibility of extracting feedback and the versatility in using the tool for different projects for the developer and the degree of interactivity and ease of use for both parties.

Case-studies always carry traces of the researcher (Yin, 1984; Tellis, 1997), making it all the more important to use a robust theoretical framework, to provide the researchers with the right perspective from which to look at the cases (Zainal, 2007). This is especially true for the evaluative kind of case-study employed in this thesis, where the researcher adds their judgement to the phenomena in the data. (McDonough and McDonough, 1997) However, even with a solid framework produced, it is important to keep the aforementioned in mind and recognise that a different researcher may reach slightly differing conclusions in case-studies of the same platforms. The case-studies will point to one platform for this thesis to test, to align with the scope of the project an allow a more in-depth look into how gamification impacts participants; this does not, however, mean that other platforms discarded as a result of these case-studies is not also worth testing in other projects.

The case-studies can be found from page 54.

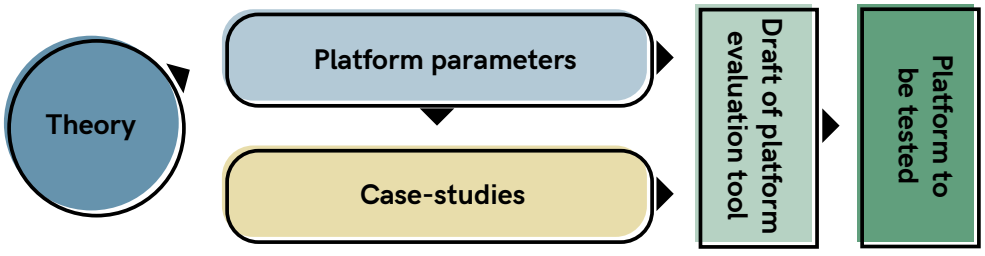


Illustration 24: Platform evaluation process.

Investigation of platform use

Coupling the platform found through the case-studies with the research questions and hypothesis posed following the conclusion of the theoretical section, an experiment will be conducted, seeking to validate the hypothesis, and so the chosen platforms capabilities as a participation tool, and to gather opinions on a restructuring of the participation process towards eParticipation in general.

The duality in the thesis, seeking to both investigate the feasibility of gamification for the decision-maker and the effects on the participants comes with some challenges. The focus will, therefore, be on the end-user, with the feasibility mainly investigated through the challenges encountered while producing a model for testing and setting up participants for platform use. With that, the main goal becomes determining public opinion, in particular Generation Y's, and their capability to use a gamified process.

To validate the usability of the chosen platform, the results will be compared to how users experience conventional participation material. Using resources on gamification only makes sense if spatial understanding is not only achieved in the citizen but is achieved at a higher degree than if gamification had not been used. As such, the first step becomes identifying an existing urban development to use as a case.

Selection of site

When testing against methods currently employed, the perfect setting would naturally have been to test the new method in conjunction with an actual hearing process. However, such municipal processes can be slow, and they hinge upon many different parties and many separate processes. It was therefore impossible within the timeframe to make any meaningful relation to such a process. Instead, an already performed hearing process will be used, and the documentation from that process be used as part of the documentation to hold the new method up against.

Using a real case comes with some critical points. Participants of the coming test has to form their opinion and understanding of the case based on the material presented, as such the case cannot be at a state of completion where the participants may already have experienced the site in real life. This especially becomes a limiting factor, when it is taken into consideration that the hearing process have to be fully complete, to be sure all posed objections and comments during the real hearing process is included in the dataset. A real hearing is meant for interested parties, who are assumed to have knowledge of the site before the development; as such, the site has to be known the advance to the participants. Lastly, a practical concern is that the site should be located where enough participants can easily be found, as not to spend additional time searching for volunteers. As such, the criteria becomes as follows:

- The hearing process has to be finished.
- Construction of the planned development have to be unfinished and the public not have access.
- The site has to be central and significant enough to ensure participants in the following testing knows of the site and its context.
- The site should be located where participants to the ensuing test can easily be found.

The last point narrowed the best possible city down to Aalborg, and as such, that was the first place a case was sought for. Multiple potentials were suggested by Aalborg Municipality's planning department, knowing the parameters used to pick. They are presented here:

1. New apartments at Limfjordsbroen's landing in Nørresundby
Development of the construction is too far along to comply with the first parameter.

2. The new development at Budolfi Square, from a parking lot to apartments
Development is regrettably started, but still behind fences. Difficult to grasp anything but building heights and material. Further, it is a well-known site, seen by the vast majority of Aalborg inhabitants.

3. Development of area around Mellemvang Skolen, currently pressured by its position between two socially challenged areas
This area is not necessarily well known to every participant, and as such does not comply with the third parameter.

4. New housing developments at 'Sofiendals Enge'
Previously unbuilt area, and as such one participants might not know unless living in the neighbouring area. Further, it is quite far along in its development, with multiple clusters of houses finished.

5. Eternitten
Next, to the harbour developments, it may be the most prominent and best-known development in Aalborg. The process has however been very long and with several technical aspects not suited for public participation. There might simply be too much data on the process to cover. Further parts of the area have finished construction.

6. The industrial area behind Kennedy Arkaden
While central to Aalborg, it is not an area inviting the public in for general use. As such, many are unaware of the lay of the land in this area of Aalborg.

From the suggestions from Aalborg municipality, only Budolfi Square seemed appropriate, with development only a little further than what would have been optimal.

Semi-structured interviews

The required data, which essentially is how the user experiences using gamification as compared to conventional participation methods, is a complex one to measure. As such, a method able to encompass complex answers is required. Semi-structured interviews were chosen as the best method, as it allows participants to put their own words to how they feel, and to give an answer to unforeseen problems or advantages in the use of the platform. As such, the semi-structured interview can be used in an explorative way, giving insight not only on predetermined issues but also uncovering which issues may be present in the first play; allowing for different methods to be employed later for more quantitative data on these individual issues. This makes the semi-structured interview a good opening method on the topic of using existing games for participation in urban planning.

Before starting such a process, it is important to get a full picture of how data should be gathered, how it should be analysed and what kind of results are sought and how they should be presented before starting on any of those aspects (Kvale, 2011). While data does already exist from the public hearings of the project, it is necessary to gather new data on the conventional method as well as the new method, to be able to one to one compare the two.

Therefore two test groups will be formed, one first seeing the plans for Budolfi through the selected new platform, and one first seeing the material as presented at the public hearing. This way the opinions and perceptions of the subjects can be gathered from using both methods. Both groups will afterwards be shown the material they have not seen, to in both cases be able to give comments to the comparative value of each method. This is illustrated below.

Other than the subjects experience in Minecraft compared to conventional ways, it is relevant to look at the subjects prior experience with games and public hearings. There will also be people with a professional attachment to one method over the other, which has to be kept in mind when inviting participants. For instance, an architect well versed in the translation of sections and plans into three-dimensional objects, or a game-developer used to the same translation but from game graphics, would not be likely to yield responses in accordance with how the general public might feel about either method.

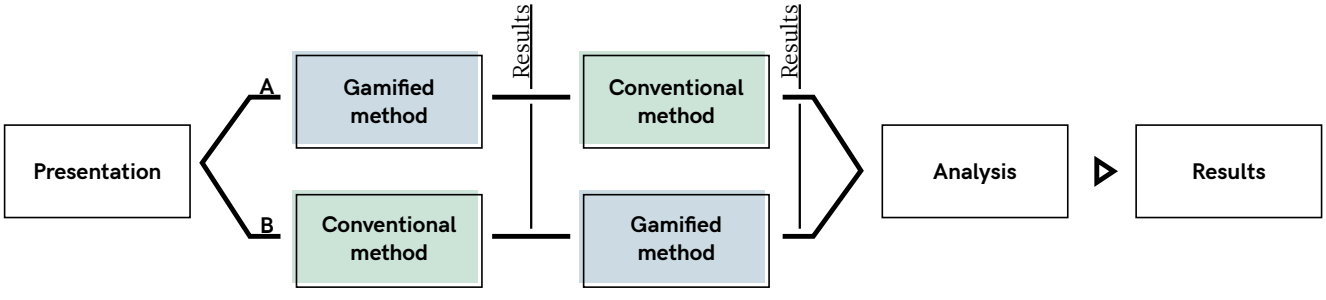


Illustration 25: Interview process.

Conducting and planning the interviews

The study is based on the results of the interviews of participants. It is, therefore, necessary to always keep in mind the established goals of the study and why interviews was chosen as a method. Further, many problems can be averted by from the start settling on the entire process, and as such being able to start doing some of the later phases of such a study before the interviews have even begun. This way eventual faults may be avoided and questions asked during the interviews can be better tailored to fit the form of analysis intended (Kvale, 2011, chap. 4).

One key aspect of planning the interviews is to understand that **"an interview is literally an 'inter-view', an interchange of views between two persons conversing about a theme of common interest"** (Kvale, 2011, chap. 1) and **"the very virtue of qualitative interviews is their openness"** (Kvale, 2011, chap. 4).

While a semi-structured interview carries some structure, and the conversational power should rest with the interviewer; it is a mistake to enter into such a process without allowing for the subject to express their view of things independently from how the researcher originally imagined things would be. The researcher has to enter the interview with a measure of 'qualified naïveté', an openness to be surprised and led down unexpected paths (Kvale, 2011, chap. 2). Instead, the researcher should focus on exploring such unexpected turns, and encourage the subject to describe why and how the surprising events occur. This all means that while some structure is necessary, and as previously mentioned the goals should be kept in mind at all times, and conversation be steered in such a way that the research questions are answered; the researcher should take care not to turn the interview into little more than a questionnaire. Improvisation is not only bound to happen, but it is also necessary.

A practical concern when it comes to planning the study is the finding of participants. As briefly mentioned in the case selection chapter, part of the process is one of convenience. The method employed is 'convenience sampling' as described by Blandford, Furniss and Makri as follows:

"The [convienience] sampling involves working with the most accessible participants, and is therefor the easiest approach. [...] research that involves other academics are often taking advantage of the comparative ease of recruiting from this population." (2016, p. 25)

The method often sees use when an experiment is not targeting a very particular group, but can accept subjects from a broad array of people. In the case of this thesis, convenience dictates a majority of Aalborg based subjects in the age group associated with Generation Y. This is perfectly acceptable, as it has already been established through the theory that Generation Y and the following generations are the likely targets for a gamified participation methodology. Less acceptable is the fact that many of the closest convenient subjects would be educated urban designers and architects, which, as established in the section prior, has to be disqualified from the study. However, assuming such a sampling method can yield a total of 15-25 subjects, it is still an acceptable method of sampling; analysis of data from interviews is a time-consuming process, and it is by no means a given that the data will be more precise or otherwise better by having more subjects (Kvale, 2011, chap. 4; Blandford, Furniss and Makri, 2016, p. 29)[1]. Moreover, the scope of the project primarily demands tendencies to be identified as part of the exploration of the topic, more statistically sound empirical studies would be a future endaveur to concretise findings of this project.

[1] Sources are intentionally unspecific on exact sample-sizes and also disagree on the recommended. It depends on the type of data being investigated, with Kvale suggesting that some studies may benefit from only doing a single or very few interviews, and Blandford & Co. arguing that you usually want at least 20, although not too many more for a project as time-constrained as a master thesis.

A last topic of planning is how the data will be gathered, which depends on what kind of analysis is planned. Interestingly one may look at the following quote by Kvale:

> **"We shall note that in several influential interview studies of the last few decades, leading to new knowledge in their discipline, no specific systematic analytic tools were used to analyse the interviews."** (Kvale, 2011, chap. 9)

What is drawn from that is that just like the conduction of the interviews themselves, analysis and precisely what can be drawn from the gathered data can be an unpredictable process. Non the less, to be able to structure the interview, the intended method of analysis will be formulated. The study is of the subject's meaning, and while some linguistic analysis may point to the subjects actual opinion, it is not where the focus will be. Instead, the goals are both a coding of meaning and interpretation of meaning, allowing for a micro-sample of quantifiable statements in various categories and allowing extrapolation of why subjects say what they do during the test.

The former of the two can be achieved by categorising statements in the pilot-interviews, and then indirectly asking subjects in following interviews to either confirm or disconfirm the original statement, thus indicating whether the majority believes this to be the case (Kvale, 2011, chap. 9).

The latter is a more complicated process of analysing subjects more interesting statements. This may be influenced by the tone of voice, and in this case, it may well be interesting to compare statements with actions using the new method of participation (Blandford, Furniss and Makri, 2016, p. 9). For instance, there could be discrepancies between a subject saying they can easily navigate in Minecraft, and then, in fact, doing so very clumsily.

To gather the data required for the above, screen capturing software will be used to monitor the subjects use of the platform, and audio recordings coupled with time-stamped notes taken during the interview by the second researcher will be gathered.

Questionnaire

As established earlier, the age and technical know-how with games as well as conventional hearing mediums are relevant. It may also be best gathered by different means than the semi-structured interview.

> **"Many research questions and combinations of questions are best and most fully answered through mixed research solutions. [...] Effective use of this principle is a major source of justification for mixed methods research because the product will be superior to monomethod studies."**
>
> (Johnson and Onwuegbuzie, 2004, p. 18)

By gathering these few bits of information through a questionnaire, otherwise distinguishable but yet for the purposes of this thesis similar replies can be categorised as they are answered, as subjects pick between limited categories of answers. The questionnaire and the answers can be seen in appendix 02, QR code 01 and will be analysed together with the interviews in the analysis section.

The greatest challenge of this method is the formulation of the questions. Care has to be taken to make the questions clearly understandable so that no subject will answer differently than another because of a misunderstanding. Options also have to include all available answers, and so never force a subject to submit an answer they themselves find incorrect or in doubt of. For instance when the subject is asked if they ever participated in a public hearing, the option "Don't know" has to be available, for those who may not be entirely confident what a public hearing is; otherwise, a yes/no answer is forced.

Practical concerns dictate as few questions as possible, as to not lose the interest of the subject. As such, only essential questions should be asked.

Analysis of interviews

The final part of the process is to extract the knowledge gathered through the interviews. To be able to perform the analyses, the audio-recordings from the interviews will be transcribed verbatim[2]. This serves both to provide accessible, verifiable material for a more efficient process during analysis, but also to make sure the researchers understanding of what was said is correct and precise. Many new angles and facets of the spoken words may be revealed by translating them into written language (Kvale, 2011).

The transcribed interviews will afterwards be organised by two methods. First, each interview will have its statements that are either positive or negative towards the use of Minecraft marked in each their colour. This allows for a quick locating of individual sentiments in later analysis. Secondly, the same interviews will be categorised in accordance with the meaning categorisation to be done later, meaning each statement belonging to a category will be highlighted in the corresponding colour. The categorisation allows condensing statements into precise points of concerns and points of advantage as seen by the subject, creating the possibility for more direct comparison among subjects.

The analysis can then commence, identifying tendencies in statements and indications of shared opinion across participants. Most important will be the comparitative data between findings of test group A and B, and an analysis of opinions might differ based on what material was first presented.

These condensed points are what will create the basis for the development of the final assessment of existing games' worth as a gamification tool for participatory processes in urban development. By verification through theory and comparison to successful examples of gamified participation, the goal is that the feedback of would-be participating citizens can lead to an understanding of which aspects of participation gamification can improve, and which challenges a decision-maker may face when utilising this new method.

[2] The full transcriptions can be found in appendix 02, QR code 01. As mentioned in the reading guide, the interviews were done in Danish to ensure the best comprehension of the questions by the participants. The transcriptions is therefore also in Danish. Following quotes from the interviews will be presented in English translated by the authors of this thesis.

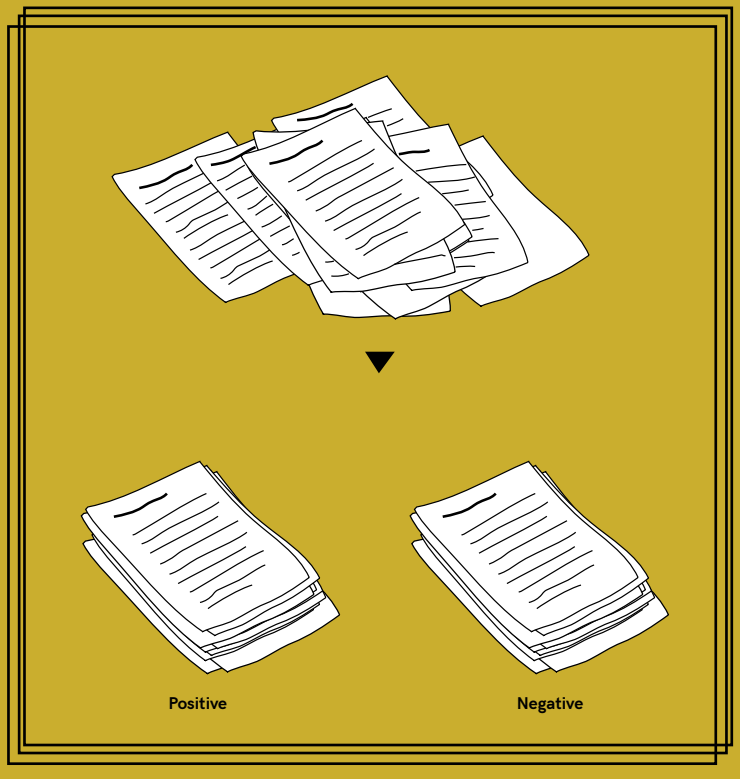


Illustration 26: Analysis of interviews.

Process

The image below shows an illustration of the full process, as it has been described on the previous pages. This provides an overview of how core elements in the thesis tie together, and how information leads to other steps. In truth the process is more iterative, with information multiple times flowing backwards in the system, and causing revisions of previous conclusions, but the illustration does mark the primary direction of the flow.

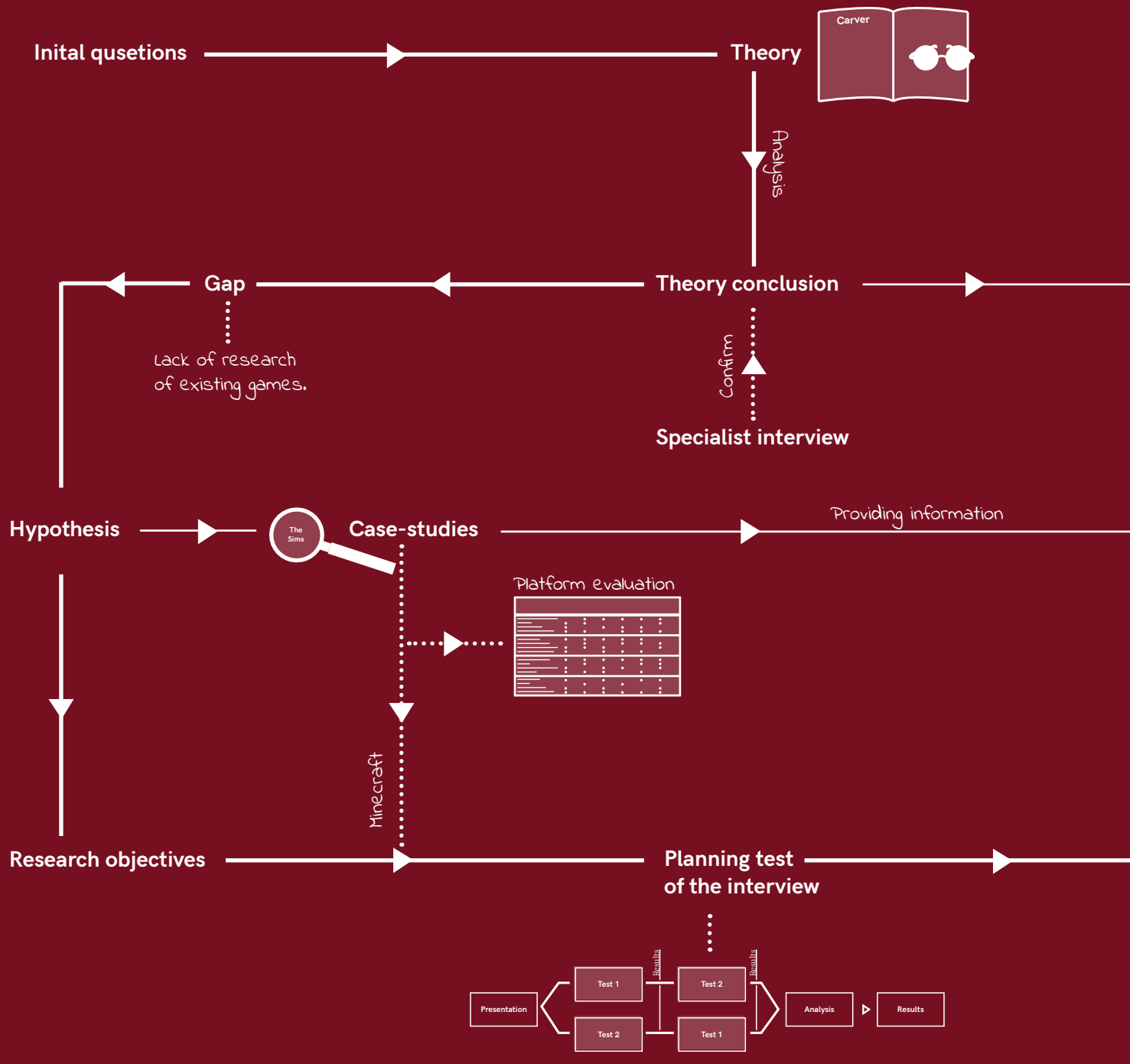


Illustration 27: Full process diagram.

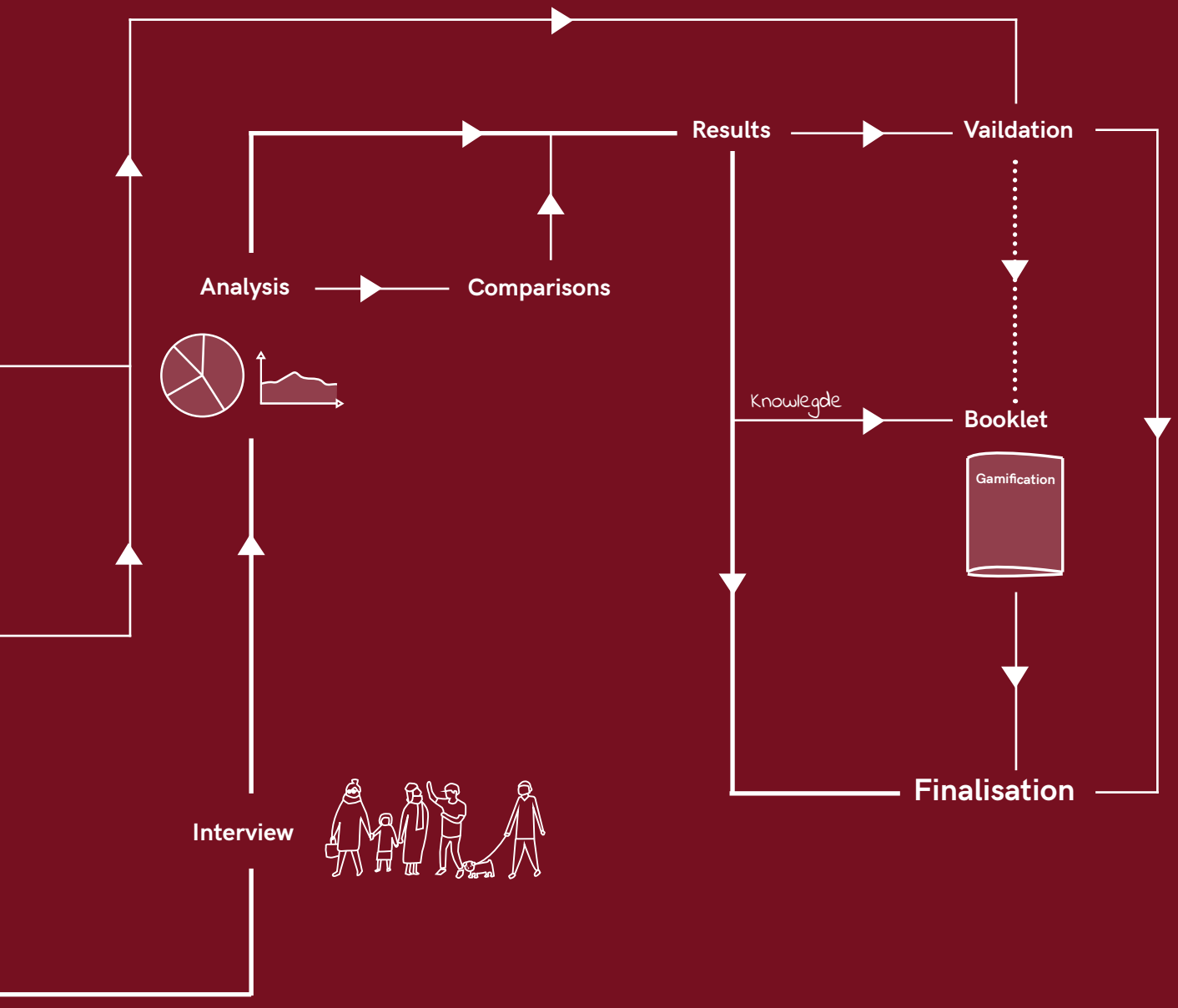

Results
Vaildation
Analysis
Comparisons
Knowlegde
Booklet
Gamification
Finalisation
Interview

Illustration 28: Photo of Minecraft on computer.

Case-study

In this section multiple case-studies will be presented to emphasise the importance of existing games and platforms used in projects done in serious games to understand the previous work. First an onverview of the development of Budolfi Square in Aalborg which contains a timeline from the participation process and quotes from the public hearing. The existing games and platforms that will be presented are the game Minecraft by Mojang (2009), the simulation tool Enscape by Enscape (2015), Cities: Skyline by Paradox Interactive (2015), the B3 game by Poplin (2012), the Sims by Maxis (2000), and the Blocks by Google (2017). Each case-study will explore the platform based on a description, mechanics & dynamics, challenges and a conclusion. In the conclusions it is described how relevant the platform is in relation to urban design and planning.

Based on the case-studies a table is made to compare and evaluate the platforms and to find out which platform will be suitable for this thesis. Further details about the case-study table and the rating can be found in appendix 01.

Budolfi Square participation process

In this section a study of Budolfi Square and its process will be presented based on an interview made with Karin Højlund, an employee at Aalborg Municipality and responsible for Budolfi Square process and excerpts from the hearing, the case-study of Budolfi Square is summarised in this section. Important dates from Budolfi are shown to give an overview and understanding of the process.

During the process of Budolfi Square Aalborg Municipality held a workshop with the citizens in April 2015. At the workshop, general endorsement for the project was shown by about 100 citizens participating in the workshop (Højlund, 2019). The workshop was divided into different stations with different themes and the citizens were able to join the theme they had the most passion for. At the different stations, an informant was discussing with the participants about the specific theme. The interesting aspect is that the earlier conclusion, describing certain demographics not attending conventional public hearings, was confirmed at this event. While the citizens turned up in strength, they had the average age of 40-50, counting children, with only a few young people and new families participated in the workshop (Højlund, 2019).

Throughout the pre-debate from Facebook, Aalborg Municipality received many comments both on Facebook and by e-mail:

"*I have my fingers crossed for an open and accommodating green are in the heart of Aalborg! Preferable in combination with shops/buildings and exiting architecture, but for the love of God an open and accommodating are which can be used recreational!*" (Aalborg Kommune, 2015, own translation)

After the local area plan was published, Aalborg Municipality received comments at the hearings such as:

"*There are plenty of "green areas" in the city Centre. There are already too many urban spaces, which is empty and unused to most of the time. Would people like to go in more urban spaces, trees and bushes, they go to parks and the forest, which Aalborg has plenty of.*" (Aalborg Kommune, 2017, own translation)

This shows one of the downsides of public hearings. According to Højlund, the appraisal for the plans for a green area received during the workshop was all but gone with the hearing for the final publication. The citizens who met there were unhappy with vanishing parking spaces and did not want yet another park. As such, the mood was confrontational, and not all that productive. This in spite of the fact that a large number of citizens initially expressed joy with the prospects. It is safe to assume those citizens still enjoyed such a prospect, but those citizens did not show up after those plans were already made. Had citizens been more broadly heard, and those wishing to avoid confrontation given the option, a more nuanced picture may have been painted.

Aalborg Municipality received many e-mails and Facebook comments during the which are accessible online; although none speak to the nature of the participation process itself. The last proposal, adjusted after the feedback, is the project currently being build at Budolfi Square and it should be completed autumn 2019.

Illustration 29: Budolfi Square participation process.

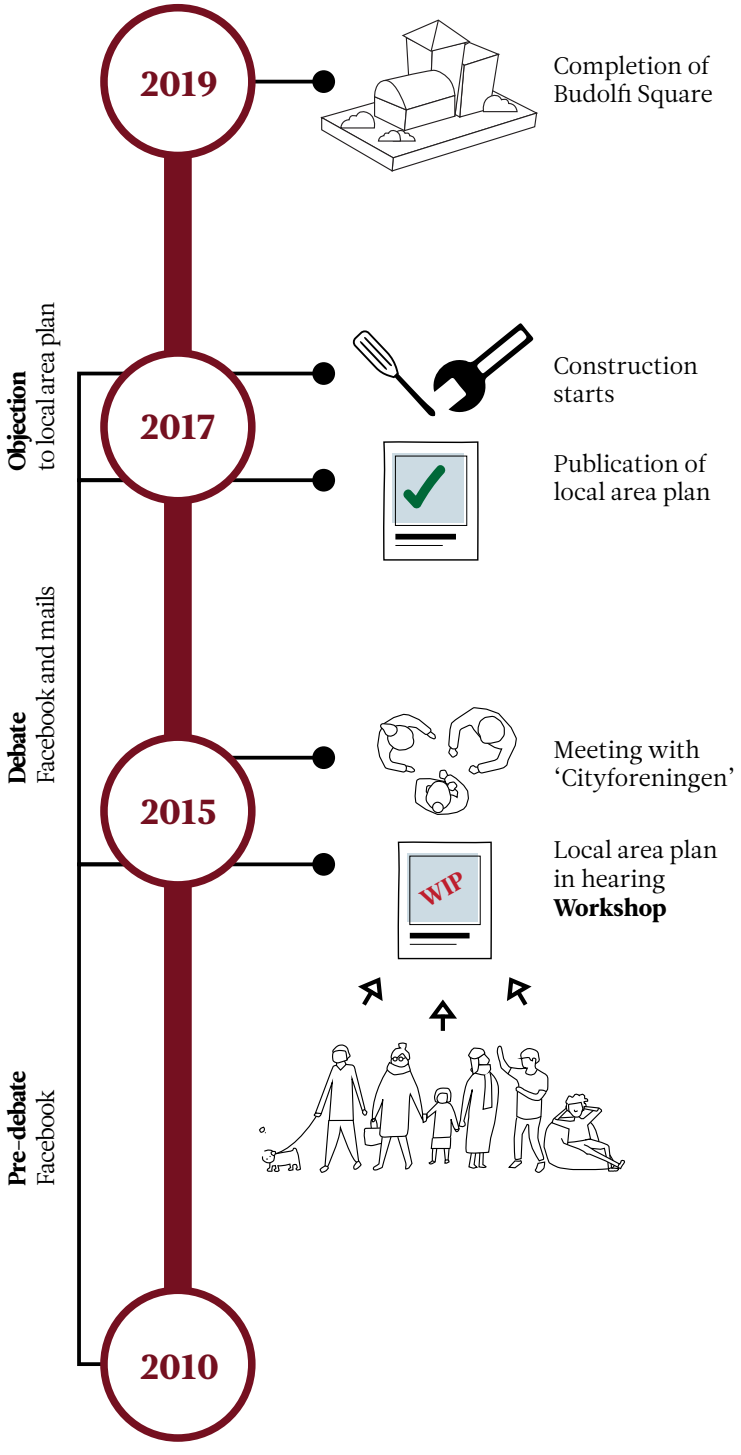


Illustration 30: Timeline of Budolfi Square process.

Minecraft (Creative Mode)

Name of game: Minecraft
Developer: Mojang
Produced in year: 2009

Description:

Minecraft is a sandbox game, baring the meaning that there are relatively few rules to the game and both a high reliance and potential for user-imagination to carry the game forward. The core game was originally designed for a form of wild-life survival game, with the objective of surviving zombie-infested nights and gather resources such as food and shelter.

A new part of the game grew from the freedoms of the game: Minecraft Creative. This mode dispenses with the survival aspects, making the player invincible and removing monsters from the game. Resources also become infinitely available, allowing the player to construct what she/he desires. This form of the game has seen popularity as a form of artistic expression for players around the world, creating everything from realistic housing areas to highly imaginative conceptual constructions.

In newer time this mode of the game has been used to supply premade worlds to various events from enhanced survival games to educational purposes such as some of the examples shown prior. This is further enhanced by the game being easily modifiable, allowing the addition of features by content creators, making it possible to broaden the limits even further. Examples of such modifications already done is the addition of streetlights, detailed furniture, driveable cars and simple interactive AI populations.

The game has over 90 million active players and is available on a plethora of platforms ranging from x-box and PC to Smartphones (Gilbert, 2018). The game is also optimised for VR, should the player have access to a VR headset.

Mechanics & dynamics:

Minecraft works through a digital equivalent of Lego-bricks, placeable in a 1 meter grid. The majority of the placeable blocks as such are 1x1x1 meter, putting some restriction on the level of detail, though the game does contain several blocks of smaller sizes, such as half-height blocks, stairs, ladders, doors, glass panes and much more. Most blocks can be placed anywhere in the grid, although a few structural dynamics limit the placement of some blocks; for instance blocks like sand and gravel are impacted by gravity and needs blocks beneath them to stay in place. Similarly, the player has to consider the possibility for a fire to spread through a wooden construction.

Challenges:

The blocky nature of the game demands that constructions are either blown up in scale or end up in a quite low resolution in terms of shape. This demands a level of abstraction from the player to translate the blocks into more fluid shapes.

Conclusion:

The high capacity for personal expression and very few limitations lets the player construct nearly anything. This is done within a simple interface and through an easily accessible game, making the game suitable for creating mock-ups of buildings quickly and without much prior experience with the game. The downside is that this is made possible through the grid, which also limits the level of detail a construction can carry.

A great advantage is the possible customisation of the game itself, allowing developers to make the game fit their needs.

Illustration 31: Screenshot of Minecraft.

Illustration 32: Render of Minecraft.

Enscape

Name of game: Enscape
Developer: Enscape
Produced in year: 2015

Description:

Enscape is a Revit plugin for making photo-realistic renders of models. As such Enscape is not in fact a game but included here due to its high VR capabilities. The program allows the creation of 360-degree pictures, loadable and dynamically pan-able via phone without prior installation of apps. (Enscape, 2015)

Further, the program does allow the full VR experience, should the user have access to a VR headset, allowing users to walk through models and experience things such as the daylight cycle in the model.

Both of these features see use by architectural studios to test specific spatial functionalities of a design, such as whether the overview from a guards position is good enough or if desks are placed optimally for various workgroups. Both examples stem from a project for 'Rigsarkivet' by Arkitema Architects, where the specified users were asked to sit at their corresponding seats in the virtual reality and judge the suitability of the design (Rytter & Thuesen, 2019).

Being a simulation, the program allows interaction between the user and the model, other than that of free movement; instead, the program relies wholly on the high detail-level to convey designs. To achieve this, materials, light sources and finer details can be made within the plugin, along with adding moving people entities such as cars and people (Enscape, 2015).

The platform is only available on PC and only through the use of professional 3D modelling software. As such the platform is not available for easy use for the general public.

Mechanics & dynamics:

The program is limited by the functionalities of the underlying 3D software. Typically such programs have an extensive palette of options to the user, in a very complex system of dynamics. This makes the programs hard to use, but able to achieve much more. Getting used to using the program may as such take a while, as some measure of experience is required.

Challenges:

The challenges of the simulation are that citizens are not able to move around in the model, they have to have a pair of virtual reality glasses at home or need to go to the workshop with the architecture company to get the full experience. Furthermore, it is a challenge that it is a programme where the designer has to have a license both the Revit and to Enscape, making it much costlier than the usual digital game.

Conclusion:

The high details that can be expressed through the programs are able to give a very clear understanding of the project at hand for the citizen. The trade-off is much less interaction for the citizen and a much-reduced possibility for participating from home. As such some of the key concerns with the involvement of younger generations as it is today is not addressed by software such as this.

Illustration 33: Render from Enscape.

Illustration 34: Render from Enscape.

Cities: Skyline

Name of game: Cities: Skyline
Developer: Paradox Interactive
Produced in year: 2015

Description:

Cities: Skyline stands out from the remaining case-studies, in being a game centred around large scale city-development. The game, similarly to older games such as the SimCity series (Maxis, 2014), takes the complexities of city planning and reduce them to systems simple enough to understand for non-specialists.

While the game is simplified, it still allows the player to decide road placement, the width of roads, creates districts and zones in the city and decides the style of architecture in larger areas. The player places critical infrastructure such as schools, public transport, doctors and various attractions; and can further design parks and other cultural attractions. The game is not, however, a free-for-all, behind the scenes complex simulations of city dynamics is underway, calculating the effects of the players' actions. Insensible road designs or over-ambitious placement of attractions in regular neighbourhoods will quickly clock up traffic and drain the funds for the city, in worst case leading to bankruptcy.

The focus on large scale is total, in the sense that the player is not able to edit the looks of the individual house, or change park looks in detail. Things such as the exact layout of a parking lot are unavailable, and while the player can exact various housing policies for an area, they do not include things such as specifically coloured facades or demands for hedges instead of fences between houses.

The game is only available on PC. Several expansion packs have been created for the game broadening the possibilities and increasing the capacity of the simulation. The game also allows user-made customisations, creating the possibility for user-designed architecture and game-systems not previously in the game.

Mechanics & dynamics:

The initial starting area the player has to work with is a 2x2 kilometre zone, which then expands as the player successfully manages the city and increases the population of the city. As the game progresses, and the village becomes a booming city, more and more options become available to the player, such as airports and football stadiums. It is, however, possible to start the game in a premade city, such as the previously mentioned Finnish and Swedish uses for public participation, allowing editing a city according to premade rules.

Challenges:

A significant challenge is the scale. While it makes to software one of the best ways to express the complexities of a city to citizens, the usage of such a tool for participation processes is limited to developments of entirely new neighbourhoods. It is also rare for citizens to concern themselves with large scale hearings, being too extensive projects to grasp.

Conclusion:

The tool definitely seems to have high potentials when it comes to large scale projects. It is impressive how such complexities have been turned into simple entertainment for players. The tool deserves more extensive testing, but the low versatility of platform makes other tools seem like better candidates for initial tests of existing games.

Illustration 35: Screenshot from Cities: Skylines.

Illustration 36: Screenshot from Sities: Skylines.

The B3 Game

Name of game: B3
Developer: Poplin
Produced in year: 2011

Description:

As part of her studies, Poplin had a serious game developed to support urban planning by allowing citizens to participate in the planning process. The game was specifically designed for a development process of Billstedt, a suburb to Hamburg. Here a marketplace had to be designed, and the game allowed citizens to express their ideas for how the marketplace should be through the game. (Poplin, 2011a; Devisch, Poplin and Sofronie, 2016)

By use of multiple screen-modes, citizens would place trees, benches and other urban elements. Upon completion, the user could upload her/his model to a cloud of proposals. This enabled the second part of the game, where users could view other submitted proposals, and give their feedback. (Poplin, 2011a)

Mechanics & dynamics:

The game is mechanically quite simple, and works primarily by the dynamic created between two screens. The plan view, and the perspective view. The player can freely change between the two, and then place 2D-sprites in either view and see a corresponding representation in the other. The choice of 2D-sprites was predefined, allowing a selection of trees, benches, water-features and similar. The elegancy of this limited set of mechanic is how it simplified game production and review of submitted proposals; as those would just be the resulting plan and perspective views in image-form.

Challenges:

A major challenge to custom games, including B3, is the time and resources required. Poplin spent five months developing a game with relatively few mechanics and limited possibilities for the user, a process that had to be undertaken before the participation process could at all start. This left the agency of Hamburg with a tool that could not be used for any other location in the city, not without redoing parts of the game. Poplin herself concludes that the work required to make a game that is ultimately subpar on multiple parameters is too much, and that usage of games in urban planning while having a high potential, may be entirely unfeasible based on this experience. Poplin tried a similar experiment with the game 'Cure for the Campus' with similar results. (Poplin, 2011a; Poplin, 2011b)

Another challenge was that of user-friendliness. While the game was simple, and ease-of-use a focus in development, no end-user would have any prior knowledge of the game's systems, and would as such have to invest time into learning every aspect of the game, with no prior knowledge. This can be included in the general setup time of a game and kept participants of Poplin's experiment hesitant to use the platform (Poplin, 2011a).

Conclusion:

While the custom design allows a higher degree of control in setting exactly what types of city furniture is available and the area in which the player can modify the scene, the downsides to time consumption and increased costs are too high (ibid.). Especially considering the foreign nature of the game to the users, and how this may be a barrier for use.

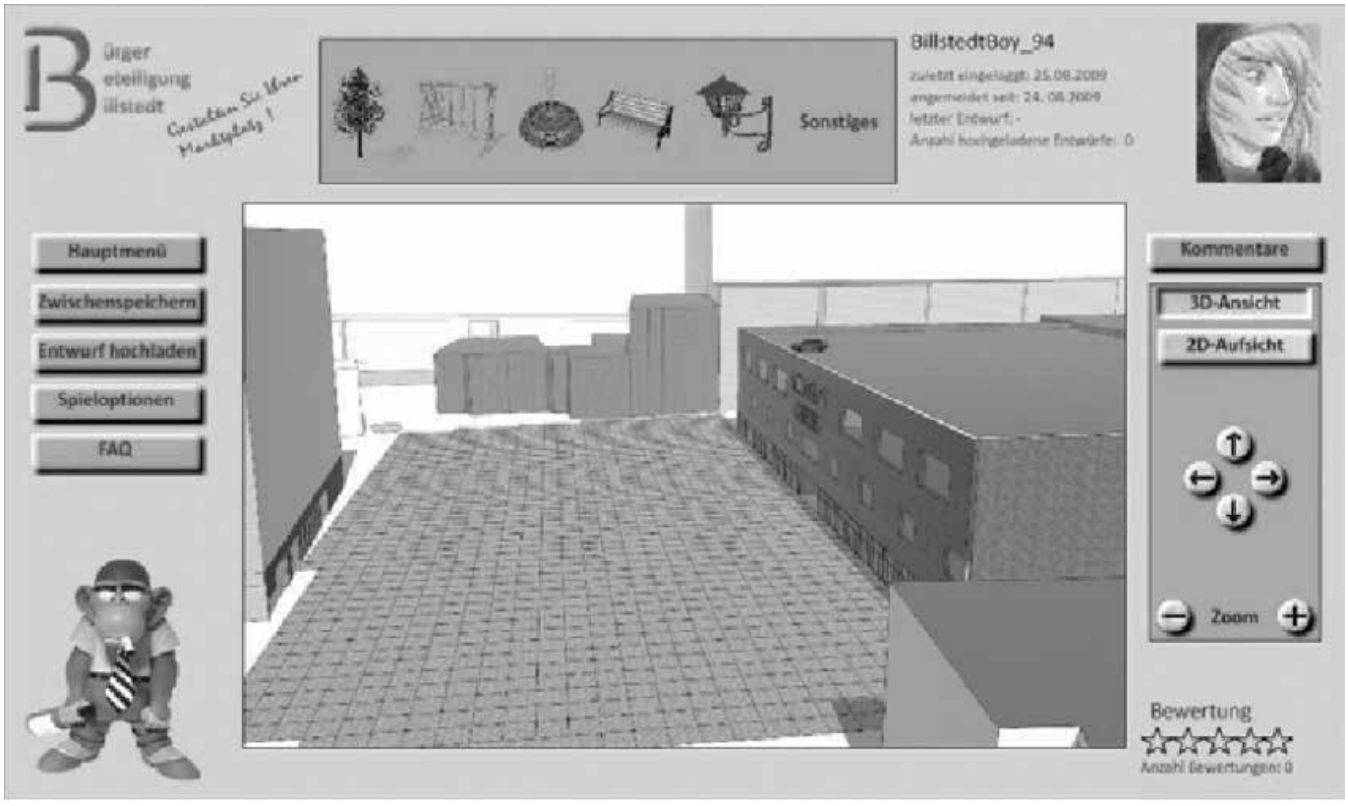


Illustration 37: Screenshot from The B3 game.

Illustration 38: Screenshot from the B3 game.

The Sims

Name of game: The Sims
Developer: Maxis
Produced in year: First version in 2000

Description:

The Sims is one of the best-known games, with a majority of players and non-players like in the western world knowing what the game is (von Borries, Walz and Böttger, 2017). The game can best be described as a virtual dollhouse, where the player manages the lives of the simulated people ('Sims' or 'Simmers'), with the primary objective of keeping them alive and happy. During this process, the player can buy everything from groceries and parties to furniture and houses.

The relevant element, in this case, is the house-building aspect. The game allows the creation of houses in great detail, from the making of interiors, including basements, half-basements and dusty lofts, to detailing the gardens.

Since the first version, three additional versions of the game has been launched, with Sims 4 as the newest iteration (Maxis, 2019). Each iteration has several expansion packs attached to it, adding more content to the game including new construction materials, more furniture and new housing plots and environments. Through these packs, the game achieves a high level of customisation of the house interior, and some packs allow the furnishing of office-buildings and other larger buildings.

The game offers only very little interaction with the urban space between buildings, however, and is mostly focused on what is in the individual plot.

Mechanics & Dynamics:

Similar to Minecraft, the games main structure is built around a grid; however, in this case, it is a two-dimensional one. Unlike Minecraft, the third axis is automated in many regards, with walls automatically rising to connect to the chosen roof and the defining of floor-heights happening separately, in a manner comparable to how it is in programs such as Revit. This is in some ways a more rigid system, with some of the most imaginative solutions being impossible to create under the game's ruleset. In turn, it makes the creation of more common solutions quicker and easier to make and often leaves an aesthetically more precise result.

Through the main gameplay, the lives of the simmers, the game motivates the player to make feasible and sustainable choices in their house design, both in regards to keeping costs as low as possible, but also by requiring practical and good solutions for the everyday needs of the simulated humans.

Challenges:

The Sims is surprisingly adept at creating houses, with the main challenge being limitations of the grid and the decisions taken out of the players' hands. These simplifications and restrictions are however what allows a player with no prior knowledge of house design to relatively quickly create her/his dream house.

The main challenge in regards to this thesis is the limits to scale. One could imagine the use of Sims as part of the hearing process of the development of a new public building, but outside this scenario, the game is limited in its usability.

Conclusion:

The game has high potentials in architectural involvement. Architects designing houses for laypeople could consider using the platform as a way for the homeowners to come with relatively precise ideas for how they imagine their house should look.

The platform is not however suited for urban design.

Illustration 39: The Sims instagram post – translation of post: "Room in Frederiksberg by Fasanvej metro rented out from 1st of May. :D", own transplation.

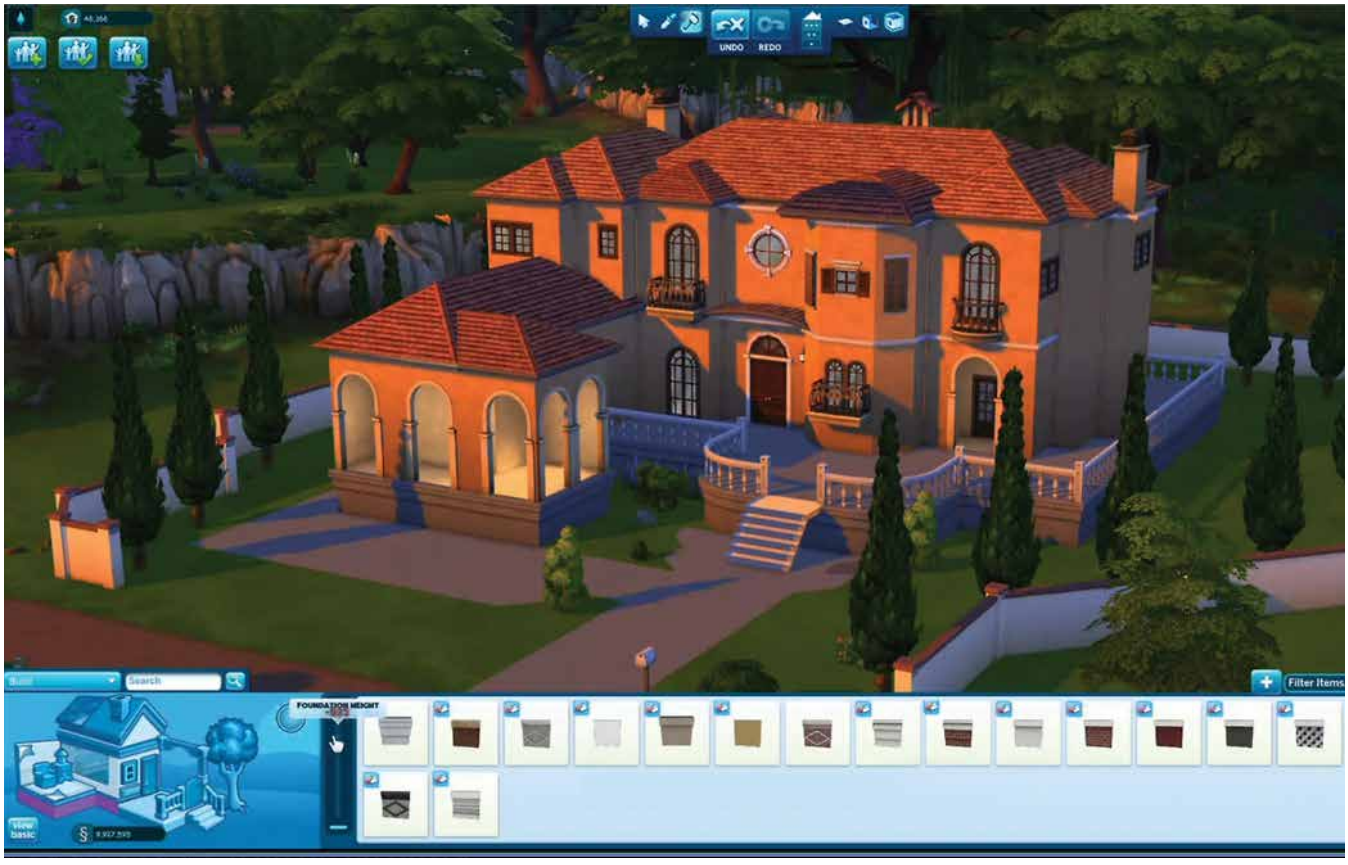


Illustration 40: Screenshot from the Sims.

Blocks

Name of game: Blocks
Developer: Google
Produced in year: 2017

Description:

Blocks is a relatively new app by Google, that allows the VR-glass wearing user to step into the environment as they create. With the hand-held tools, users can make shapes, extrude surfaces, divide vertices and drag those around. The play can colour surfaces to create intricate textures and rotate their model as they see fit; all while being able to walk around their creation and sculpt it as a sculptor would a marble statue.

The application is made with smaller objects in mind, but nothing prevents it from being used in larger-scale projects; as long as the device used is powerful enough to simulate the environment that the user is moving through.

Compared to the other cases, Blocks is more about the individual shapes, with a significant degree of user interaction with every little bend. With the earlier analogy of some games being like digital Lego-blocks, this app would be comparable to digital play dough. The goal with the game is to make the shaping of the 'dough' intuitive and make the moulding possible by hand-movements and just a few different in-built tools.

Mechanics & Dynamics:

The technology is relatively new, and both as a result of that and to keep things simple for the user, the tools are quite limited, and while the platform does offer very quick shape-making, adjusting the creations and making minor changes can both be difficult, and the users' control is limited. The application makes many decisions on behalf of the user, such as how to best connect surfaces as vertices are being moved, and the user has no way of changing this haphazard behaviour.

Challenges:

The primary challenge in using this is the requirement for VR equipment. VR is yet to be commonplace in the average household, and so such a participation system would not allow the participant to contribute from the comforts of their own home. Even if they should have VR equipment, it is further unlikely they have machinery powerful enough to run a big VR environment, such as a full-scale neighbourhood being processed.

A second disadvantage is that while the program seeks to be user-friendly, the complexities of a large model with many consecutive edits made to it may hamper the average user's capability to manage the many shapes in a large scene.

Conclusion:

The technology is exciting and very promising. The ability to seamlessly shape things in a virtual environment is ideal in many ways. The technology is however not yet commonplace enough to be useful for open participation processes, and people's familiarity with working in VR is not strong enough to reliably assume people's capability to produce meaningful results.

Illustration 41: Blocks advertisement.

Illustration 42: Picture of Blocks environment.

Case-study table

The outcome of the case studies contributes to the understanding of serious games and the different platforms that exist today, some of which has also seen examples of usage in design and participation processes. The table on this page summarise the conclusions to some of the kay parameters to a games usability in urban design. This table will assist in an initial choice of a platform most likely to be best suited for the following test of a gamified process regarding Budolfi Square.

The values used in the table are informed by the theory sections, with corresponding weighs. For instance theory on spatial cognition and gamification informs that photorealism may not be as crucial as first assumed, but that interactivity, ease of use and accessibility are vital. Other parameters, such as "VR-readiness" can be downplayed, as a focus of this thesis is to make participation from home, and few have access to VR at home. More generic parameters such as price, are mainly relevant to the feasibility of using the platform as an agency, just as parameters such as the possibility of efficiently providing spatial feedback in the platform is essential to make the whole process easy to use and evaluate for the decision-maker.

Despite this information shaping the table, the exact chosen weights and parameters are a matter of debate, and other priorities could be chosen for different projects. As such the resulting table should not be seen as a factual sheet of absolute numbers for each platform, but rather a multi-faceted and part-subjective evaluation of the platforms.

In appendix 01 further argumentation and explanation for the thought process on each point can be found.

		Minecraft	Enscape	
Platforms in general	Weight			
Realism	**1**	●	● ● ●	
Interactivity	**3**	● ● ●	●	
VR readiness	**1**	● ● ●	● ● ●	
Versatility	**2**	● ● ●	● ● ●	
Price	**3**	● ● ●	●	
Simulation of life	**2**	●	● ●	
Platform's usability				
Usability for the developer	**3**	● ●	● ● ●	
Ease of use for the citizens	**3**	● ● ●	● ●	
Participating from home				
Easily accessed/install from home	**3**	● ● ●	●	
Easily provide relevant information	**2**	● ● ●	● ● ●	
Possibility for feedback to decision-makers	**2**	● ● ●	● ●	
Public hearing				
Easy to setup for developers	**2**	● ● ●	● ●	
Possibility for citizens to study it by themselves	**1**	● ●	●	
Weighed total		**74**	**55**	

The table concludes Minecraft as the best possible platform. As revealed in the case-studies, the many systems of other existing games, while beneficial for teaching the many dynamics of a city or a home, are also restrictive to the creative process, and complicates user-entry into using the software. Minecraft is also cheap to buy for the user or the agency and is by far the most available of the platforms, while being easy to set up for participatory use.

	Cities: Skyline	The game B3	The Sims	Blocks
	●●	●●	●●	●
	●●	●●	●●	●●●
	●	●	●●	●●●
	●●	●	●●	●●
	●●	●	●●	●
	●●●	●	●●●	●
	●●	●	●	●
	●●	●●	●●	●●
	●●	●●●	●●	●
	●●	●●●	●	●
	●●●	●●●	●●●	●●●
	●●●	●●●	●●●	●●
	●●	●●	●●	●
	63	57	57	52

Illustration 43: Render of Budolfi Square Minecraft project.

Interviews

This chapter goes through the results of the interviews, along with an analysis of statements and a comparison of responses across groups. Together with selected quotes, this serves to confirm or deny conclusions drawn from theory and examples of gamified participatory processes.

This condensed dataset will not only be critical for the further discussion of possible applications of gamification in urban design but also be the only data source on whether exciting games, and specifically, Minecraft works as a tool.

Further, from the discussion, this data and how users experienced using the game and the challenges they had will be vital to the production of a folder with recommendations as to when and why decision-makers should use gamification, and some of the challenges to be aware of when utilising this technology.

Participants

17 people participated in the testing of using Minecraft as a gamified means of participation. The group foremost gathered based on convenience sampling, but age, education and availability further sorted the group, disqualifying a majority of possible subjects. Remaining 17 subjects filled out a survey to confirm some of the quantitative data on their experience with games and participation.

A majority of eligible participants had not only regular experience playing games at one point or another of their life, and so an innate understanding of game mechanics and -controls, but a majority had also played Minecraft before, albeit some to a quite limited degree. This serves to confirm that many people of the age-group have personal experience with games, and so have an advantage when it comes to translating virtual game-environments to urban development plans.

The selected group, mainly university students studying topic not related to gaming, may not be representative of the general publics experience gaming. This has not been further investigates, but the previously presented statistics on the explosive increase of gaming over the last few years, may indicate that the numbers gathered for this thesis may in fact be lower than what could be expected from the average person. This is however speculation.

A very large majority, 89%, of participants have never attended a public hearing, leaving only two who had, one of which had gone with his family while still living with his parents. This reflects well how young people, in this case the younger half of Generation Y, do not in general attend public meetings. Multiple participants were unaware of what a public hearing was, and most were uncertain about the process and whether anyone could just freely join in on such a process. Interestingly 72%, all but 3 of the subjects who had not participated in a hearing, said they were either likely to attend or at least more likely to attend, if participating could be done more effectively from home. This serves to indicate that the previous theoretical findings, that the freedom of when and to which degree, along with the avoidance of confrontational or dumbing gatherings, is attractive to the younger generation, and may well increase the rate by which this generation participates.

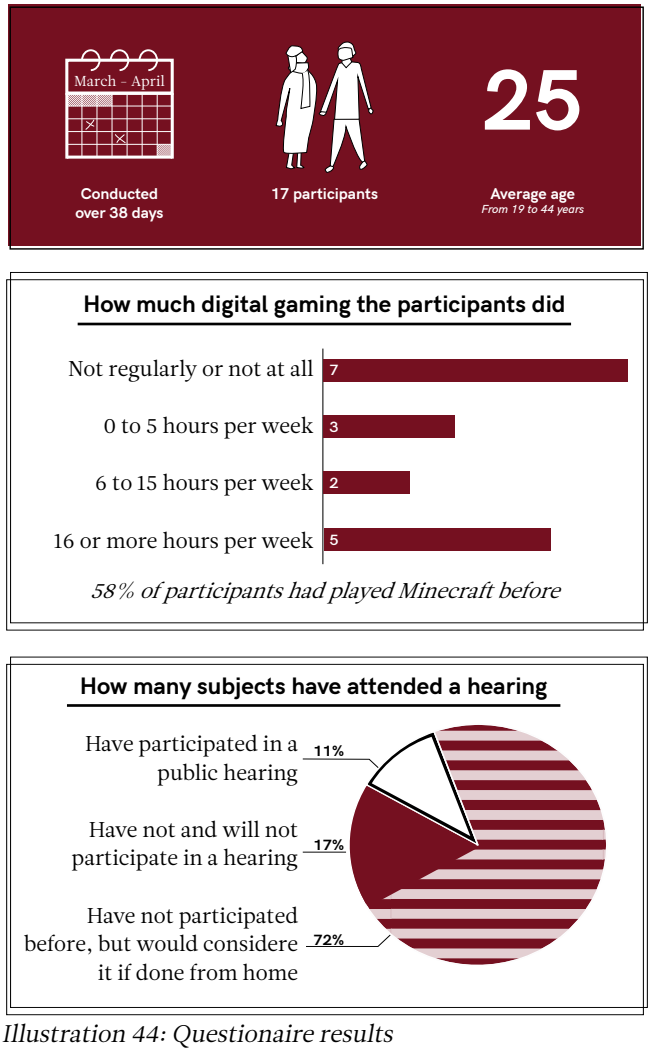


Illustration 44: Questionaire results

Interview material

This section will briefly describe the material presented in both phases of the interviews, along with a description of the general interview progression and time consumption, as well as describing the limitations in information provided to participants. To perform the interviews and analyse the differences in perception, the created Minecraft Model had to resemble the project presented at the public hearing as closely as possible. On illustration 46 you can see an example of how the Minecraft model looks compared to the presented material at illustration 45.

The interviews would then be conducted as previously described in the methodology section. As participants did not attend the real public hearing, and so was not provided with any of the verbal communications of that hearing, they would only be presented with the information available from Aalborg Municipality's website, numbering images like shown on illustration 47. Similarly there would be no further explanation as participants would play the world in Minecraft, limiting the new knowledge provided to participants to be that of how to control the game. Renderings and screenshots of the Minecraft model can be seen on illustration 49. More images and footage can be seen by using the QR-codes on the following page.

A typical interview wound up lasting 20-30 minutes from the filling out of the survey till the end of the Minecraft experience or reviewing renders. In a real hearing scenario participants may spend more and less time trying to understand the content, depending on their priorities. The interview was kept brief to more easily attract participants. Interviews were audio-recorded and the Minecraft screen was captured.

Illustration 45: Render of Budolfi Square

Illustration 46: Minecraft render of Budolfi Square

As seen conventionally


1


2


3


4


5

Illustration 47: Rendering of square, conceptual illustration, masterplan, birds-eye render & perspective plan.

Illustration 48: QR-code for more coventional material

As seen in Minecraft


1


2


3


4

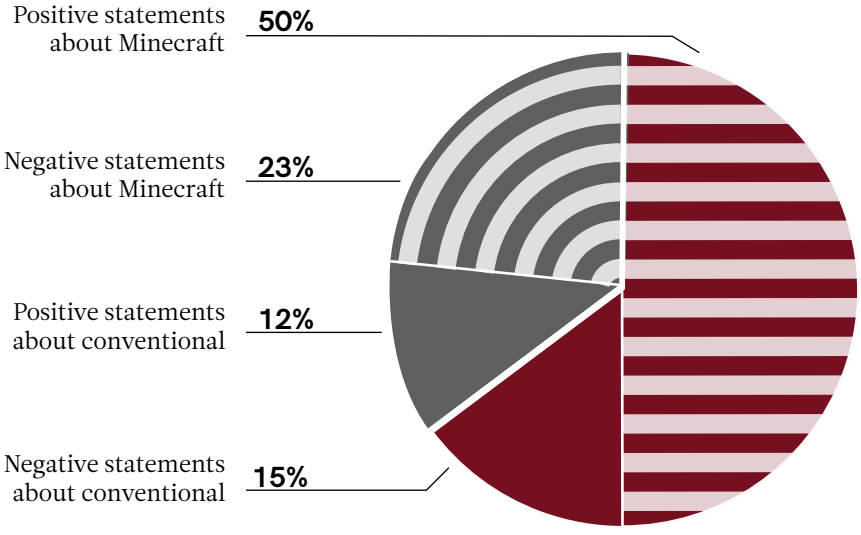

5


6

Illustration 49: perspective, screenshot from the game, rendering in perspective, birds-eye render & perspective plan.

Illustration 50: QR-code for more Minecraft material

Results of interviews



70%

of the asked participants favour, to varying degrees, a gamified method of participation after having tested use of Minecraft. **65%** all statements are either positively loaded for a change, or negatively loaded towards the conventional method.

Illustration 51: Positive and negative analysis

An initial analysis of statements is one of positivity or negativity towards a reformation of the participatory system. Assuming that the interviewed subjects is representative of the age group, this provides insight into whether or not past assumptions about the advantages of gamified participation carries any weight. The analysis does require some interpretation by the analyst. When is a statement opinionated enough to be considered counting towards positive or negative, and when is a statement simply a repeat of an already stated positive. The analysis does not account for some statements potentially carrying heavier weight than others. The upside to this is that the analysis becomes more objective, without the researcher having to estimate the sincerity and importance of the subjects opinion.

Statements can both be grouped by topic and by which method they prefer. In the above diagram striped chapters represent opinions about Minecraft and plain chapters opinions on the conventional method. More importantly however, red represents statements leaning towards a reformation of the participatory methods, while grey represent the opposite.

A majority of statements, 65 %, are statements either praising the use of Minecraft or criticising conventional means. When looking at the individuals opinions, 70% of participants favour the gamified method in a majority of their statements, 5% are neutral and only 25% favour the conventional method.

On the following page is a more in-depth analysis of the interviews. Here all interviews are scanned for statements either confirming or contradicting eight assumptions. The eight assumptions are first of based in the initial hypothesis, but were also altered with the conclusion of the interviews to allow for changes in accordance with new insights and suprising repeated statements throughout the interview. Subjects were not directly asked to respond to the assumptions, as to not lead them, instead the interviews tried to steer subjects to voice their own opinion in the matter. This means the statements are not direct quotes, but rather extrapolations or simplifications of similar statements, especially in cases where the vocabulary of subjects to express increased or decreased spatial understanding became a limiting factor.

Not all respondents touched upon each topic, as well as some interviewees responding neutrally, unknowingly or multiple times and contradictory on a statement; these interviews were discounted in the corresponding category.

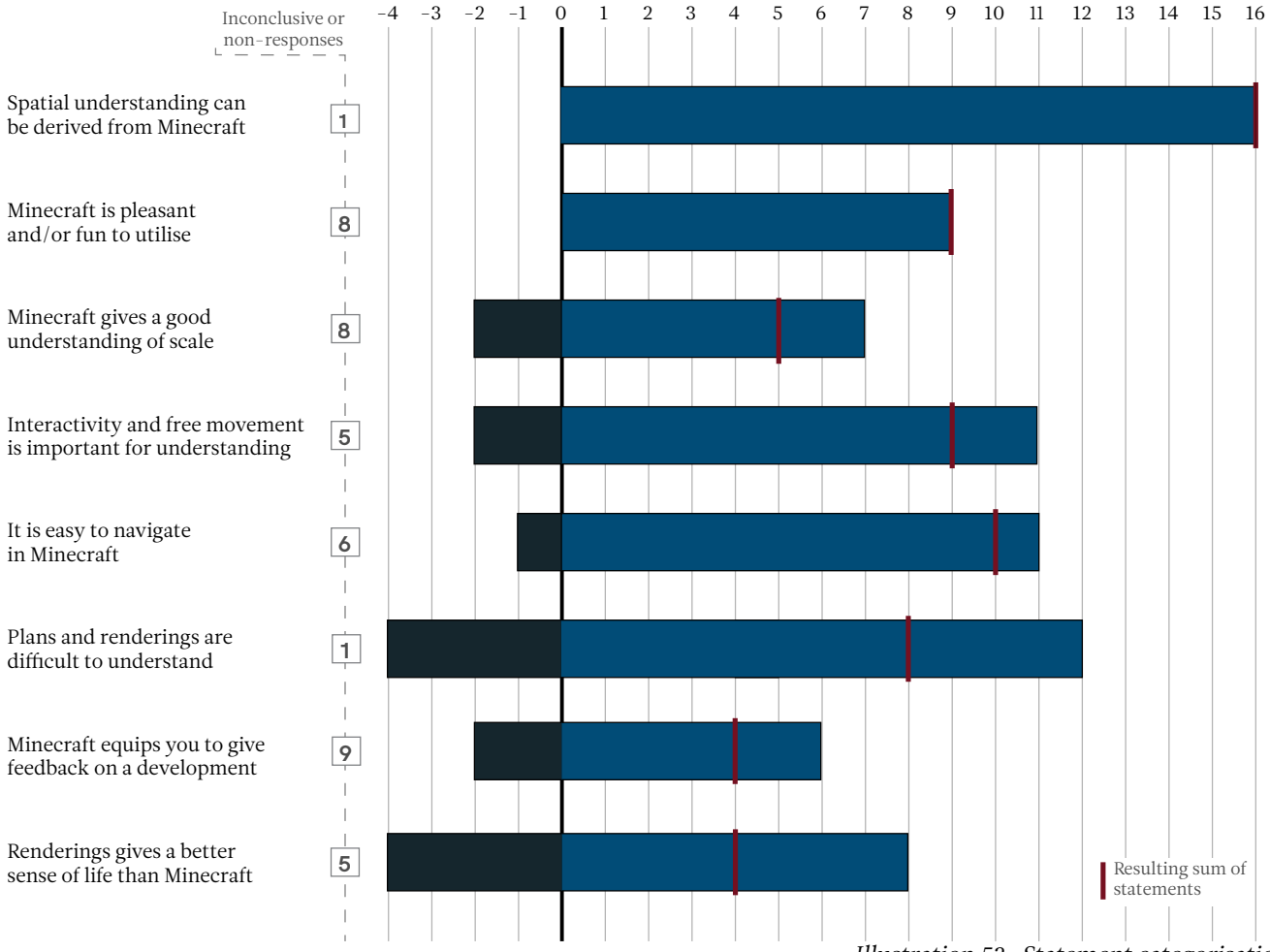


Illustration 52: Statement categorisation

Categories are as shown on illustration 52, and have been picked with the following goals (corresponding order):

- The main hypothesis is that Minecraft improves the understanding of a project, this statement serves to confirm or deny this.
- Gamification may serve the added benefit of motivating users to participate more, not only through ease of use and accessibility, but also as it may simply be fun to work with. This statement will indicate whether there is truth to this.
- A bended version of the first statement, but with a more explicit purpose of figuring out if participants feel as though they walk the development in a 1:1 model, rather than in a scaled up or down version. This in many ways is a way to confirm if a subjects original statement regarding spatial understanding is truthful.
- In addition to potentially being more fun to use, an important aspect of gamification over simulation is that it allows the user to interact to a larger degree with the model. This statement investigates the truth of this.
- For the above to be useful, navigating the model has to be easy. Further this statement seek to further confirm the first statement, as being able to recognise where you are is the first step to understanding any project.
- The opposite polar of the first primary statement. One question is if gamification gives good spatial understanding, another if is plans and renders do not, or at least if Minecraft gives a better one.
- An ambigious topic, foreign to most who have not participated in public hearings before. Still, getting a sense of whether or not subjects feel as though they are well enough equipped to provide feedback, gives a sign on whether they would consider participating further as a result of having played a development in Minecraft.
- An assumption of one of the problems with simple Minecraft models, is that it can not simulate details and human life nearly as well as a render. Now this may not be as essential as a spatial understanding, but with the aim of knowing the significance of this weakness the statement was posed.

All assumptions investigated on the previous page are affirmed to varying degrees, however some with only limited amounts of responses. This is not altogether surprising, as theory and past examples of gamification use in participatory processes already pointed towards this being the case. It does, however, unlike past examples, confirm that this remains the case with a sandbox game such as Minecraft, which allows the continued deliberation of existing games and even quite low-detail games being quite apt for such purposes. Most surprising is that the subject's opinion on whether or not renders provide necessary detail and a better sense of the place than Minecraft is relatively weak, to the point where a third of responses directly said the opposite, being able to abstract and imagine the area better from the low-detail Minecraft model.

While a small sample size, and so challenging to draw generalising conclusions, there is little doubt that the statements at the very least embolden the fact that this is an area not only needing more research but an area that should be prioritised.

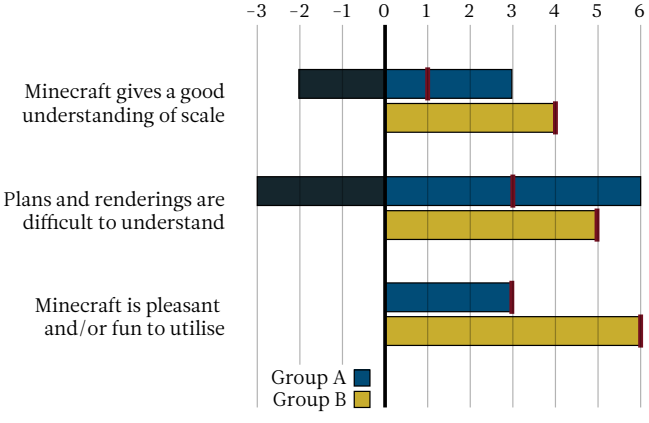


Illustration 53: Group A B comparison

Most of the statements are either similarly disposed in group A and B or distinguished by easily explainable factors of how the interviews were structured . A few, however, stands out. Both statements on the understanding of scale and if plans and renderings are difficult to understand show a significant imbalance across the two groups. In both cases group A are alone in having any statements contradicting the assumptiona leading to higher total values for group B. A potential reason for this, and a very interesting one, is that:

a) Understanding the scale of Minecraft is perceived easier once compared to having to understand scale from renders and plans. While the task should be the same, the relief of finding an easier means may lead to a positive answer, even if it would have been negative if the subject had not first attempted to understand renders and plans.

b) Plans and renderings are difficult to understand but become more manageable if an understanding of the spaces and volumes have already been achieved. This is not surprising, but it does indicate that hearings without the possibility of granting this understanding first, will leave participants challenged in terms of understanding what the design is.

Lastly, many more participants of group B express enjoyment with the game itself. Again this could be linked to the frustration of having to understand the plans, and the stark differences in understanding given by the platforms, making relief a significant factor in the enjoyment of the game.

This [the plans] is complete gibberish to me. This [the perspective plan] makes a little more sense, but it is still mega difficult. Maybe... these two together [Renderings and Minecraft]. What I miss in Minecraft is exactly this... tactility. 'What is it made of?', 'how do people looking walking around in this?', stuff like that. However, I can't at all orient myself in the renderings, that I can do in Minecraft.

- Interview with HS

HS gets no valueable information from plans, not being able to translate the language into shapes that she understands. The renders however does give her something that Minecraft does not, and so, as a few others, she suggests the combination of the two to be the better solution.

If you had Minecraft to understand the sizes and the renderings to see the mood, you wouldn't need an expensive animation.

- Interview with ML

ML brings insight into the cost-effective side of things, questioning wether its even worth producing high-detail content as Minecraft gives a good understanding of the volumes. Through this, he also confirms that he has achieved an understanding through Minecraft.

I like the idea of doing it [participating] from home, that is actually quite cool. [...] At home you can do it in your own tempo, sit down and spend a little more time getting acquainted with the model. I believe I have an easier time understanding the project three dimensionally instead of just reading a project.

- Interview with SA

SA, amongts others, confirms that the freedom of being able to participate when it suits you and from the comforts of your own home. SA further confirms that this would be a challenge given only conventional material, as he understands the project better looking at the 3D Minecraft model.

Oh, this is cool! It is a lot easier when you steer yourself!

- Interview with HS

HS here gets to play Minecraft for the first time, and find it a pleasant experience.

[Upon seeing renders] First off... I don't know what angle I am seeing things from. I have no spatial understanding of where I am when I see this, and I can't turn around and figure out where I am in relation to the points that I know.

- Interview with SAJ

SAJ puts words on one of the big problems with renders. SAJ enjoy the mood expressed by a render, but has difficulties placing the render in relation to the design. The leaves a sense of confusion, that is dispelled when instead seing he area in a virtual 3D interactive environment, allowing navigation in the area.

I think it's really good that you can come down between the buildings too. You get different perspectives on it all. There [on the plans] you get no real understanding of the spaces in the way you otherwise could.

- Interview with JC

JC speaks to the great advantage of interactivity, and how it improves understanding to be able to go directly from a planar view to being immersed into the site, rather than having to switch between different images.

I think it makes a lot of sense. You get a good insight into the project. Plans are damn hard to read, and renderings only make me more confused, they are too abstract. It might look good, but where is it? Minecraft is easier, that's 1:1, a more edibile perspective. It's quite funky! Makes a lot of sense.

- Interview with MT

MT speaks to general excitement with the method, considering it much easier to use and a quite fun experience. He also mentions the scale feeling more right, with the game being more immersive.

I think it is quite nice that you are in control yourself. It seems quite simple. It is advantageous that I can both walk around the area and fly up and see it from above; it gives a good view of what the idea is. Moreover, then if you want to look closer at something, you can go check it out yourself.

- Interview with KSS

KSS not only confirms JC's comment above, but also mentions that being able to chose your own focus, and look at what you find interesting is smart, and makes engaging with a participation process nicer, as it will always be relevant to what interests the participant.

Colcluding remarks from interviews

The hypothesis of this thesis is that Minecraft can improve the participation process and crate a better understanding of a project to the non-specialists. 17 participants contributed to the interviews for us to investigate in the hepothesis. Some participants had experiences with Minecraft and some participants did not have the experience but found it easy to navigate.

Based on the interview made with participants in this thesis some tendincies can be concluded. 70 % of the participants preferred the Minecraft model combined with some information about the project, such as relevant information about functions or general ideas in words. When comaring the two test groups where gropu a have been tesed in Minecraft as the first thing and group B was tested in the conventional method as the first thing. It can be concluded that the participants have explored the digital world in Minecraft they have a better understanding of the conventional plans and renderings. However, many of the participants found renderings confusing because they were not able to relate to the picture in its context. The renderings did also create the tactility in participants which they did not get from Minecraft.

When the participants are able to move around in their own tempo it allows the participant to understand the space in their own tempo and if they want to check up on a specific place they are able to do that.

Interview

Participant moving around in Minecraft with a bird-eye view of the project.

Participants

Generation Y
is the focus

Interaction planning
conventional planning

Conducted over 38 days

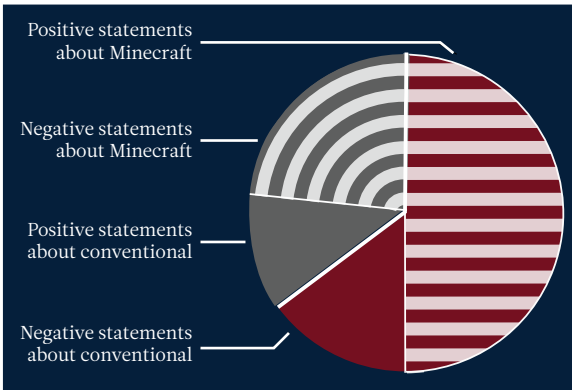
17 participants

25

Average age
From 19 to 44 years

Analysis

70% Preferred Minecraft above conventional material



Minecraft

"Oh, that is cool! It is a lot easier when you steer yourself!"
Interview with HS

Illustration 54: Interview summary.

Illustration 53: 'Gamification & urban design' folder

Discussion

The findings of the interviews coupled with knowledge from theory and past examples of gamified participatory processes lead to a conclusion on the capabilities of existing games, and whether this platform should be considered for future research and testing.

First, however, the information gathered has been condensed into a brief booklet with recommendations and advice for initiating gamified processes in urban planning. The booklet is targeted at developers and in particular municipal agencies, and briefly outlines the advantages and challenges; working of conclusions and arguments presented in this thesis but put much more briefly.

The booklet is kept separate from the report to provide an easily read stand-alone piece for those without resources or need to read the full theory and interview set that leads to the opinionated, yet well-founded arguments presented in the booklet. The booklet can be found attached to this thesis.

In the coming chapter, the validity of the hypothesis will be concluded upon, and as such, the feasibility of using existing games, and in particular Minecraft in urban design. Further, the chapter reflects on the process and the choice of topic and takes a look at what steps are required for future research.

Conclusion

Through the theoretical review, two key elements were identified: immersive, interactive environments can assist in improving the understanding of spatial developments with citizens, motivate more citizens to engage and provide a broader range of feedback to the decision-maker; and, custom games are too foreign, too pricey and too time-consuming to make and distribute. With very few having done any studies on the application of existing games, a gap of research was present, and one that just might be able to be the good solution achieving the benefits of the above but avoiding the disadvantages.

The tendencies shown in the interviews align fully with the hypothesis that, at least for Generation Y, existing games can offer a greater understanding of a development and participants express excitement with the new method, favouring it above the conventional means; this is at least sandbox games. It aligns well with examples seen across the globe, showing real practical use of Minecraft and other existing games in such developments.

On top of this, the cost of the platform is low, and a majority of subjects have knowledge of the platform in advance and can recognise base mechanics and dynamics; preventing the estrangement of participants experienced with some custom games.

The ease-of-use for decision-makers have primarily been investigated through the process itself, and how little preparation was required to set up the case of Budolfi in the world, and introduce subjects to using the game.

Challenges

The above does not mean that using Minecraft is without its issues. Minecraft was picked because, of the studied existing games, the game allows a high degree of freedom in how it is used, and the game is the biggest game in history in terms of player-base, and as such known by an extensive group of citizens, either as players, or as parents or friends to players.

Despite this, the game still has its limitations. The game was developed for an altogether different, zombie-fighting purpose. The fact that the game still succeeds in functioning as a participatory tool in urban design is encouraging and speaks to the potential of developing a game that is as versatile, useable for a variety of scales and sites, but made for the purpose of such processes. Conceivably this could be limited to a modification of the existing game, with a focus on improving the options for participants to provide feedback within the game.

Further, while usage of the platform is cheap relative to general costs in developing a site, it still an added expense. Decision-makers could reasonably ask if it is truly necessary to improve the participation process, in spite of arguments in this thesis stating that an improved process is helpful not only to the citizen but also the developer. This is enhanced by the fact that society is not at a stage where gamification can replace conventional means. Too large a group of potential participants, in particular, the older generations, require the current methods to stay. As such, agencies conducting a gamified participation process would need to run two parallel processes. This does, of course, broaden the group insights are gathered from.

Result

This pilot research on Minecraft usage revealed the great potential in the platform. With no better widely accessible and recognised tool, Minecraft seems to be the best platform available; and it seems to do at least an adequate job in the targeted generation, and more importantly, a better job than current methods.

Working further, both with developing tools within Minecraft and other games to enhance the capabilities of this method. The tendencies revealed from this thesis are clear, but broadening the perspective outside urban design, and looking at the rampant increase in gamers worldwide, it is clear that this massive shift in society will have effects on the field of urban design as well as most others. With this thesis, one such way has been explored.

Discussion

The conclusions brought forth from this thesis, and their confirmation of the initial hypothesis is mainly surprising in how clear they are. While some of the initially assumed problems with gamification holds fast, some were rejected or heavily diminished. For instance, it was a revelation how little the low detail of Minecraft mattered and how easy it was to abstract from this gamified reality it was for the subjects of the tests. While the test was indeed of limited scope, the indications clearly shows a trend towards great usability of gamified participatory processes.

Relation to prior research

This thesis ventures out to research the appliance of existing games, over that of custom games. The vast majority of prior research on the field has been with custom games, with mixed results. Often conclusions have been along the lines of it being effective at conveying a spatial understanding, but it being very time-consuming and financially costly to produce the game, and afterwards, a significant challenge was to get participants to use the game, as the platform was wholly foreign to them.

With Minecraft the responses to how the planned development was perceived were overwhelmingly positive, and this is achieved using a platform that a majority of people of the targeted generations are at least acquainted with. Development of the model itself was, in terms of urban developments costs, relatively cheap, and no time had to be spent on game development.

This forms a quite persuasive argument that not only should research into gamification continue, but a shift of focus to platforms known by the user, and already available should be done. Ease of access and knowledge of the platform seems to, in every way, be more important than the added customisability and detail that can be achieved in through custom games.

Besides the above point, the results of this thesis primarily affirm what was found in theory. Interaction and user-control play an important part, and so games can compete with simulations and the level of detail they can provide; which of the two is best seem to be down to the individual user, but both have their right as representative tools.

Games, however, hold one advantage over simulations in that a larger audience considers them fun, and already play games for entertainment purposes in their everyday life. The significance of this should not be understated; at the end of the day, motivating citizens to participate is just as important as making them understand what is presented when they do participate.

Minecraft and other platforms

In this thesis, besides case-studies, only Minecraft was researched, as a result of the freedom and accessibility that Minecraft provides. Foregoing testing of other existing games naturally leaves a gap in terms of which platform is best for which particular type of development. That said, through the case-studies alone, platforms were divided into different scales of projects, which can be concluded with some certainty (i.e. big scale city simulators simply lack the tools to develop one small square and creating a full-sized city neighbourhood would be an immense task for the citizen in a sandbox game). Which game is best within each category is probably down to personal taste and is also something we can expect to change every time new games are released.

What can be concluded is that Minecraft does quite well at the job. Functioning like digital Lego-blocks, the options are near endless for the user and the mechanics and dynamics defining what can and cannot be done within the game are relatively easy to grasp. The results regarding accessibility likely also indicate something about the complexity of a game, while it can be tempting to add features and broaden the available options within the game; this may not be the way. It is worth considering at what level citizens should participate, and if it might be enough to have them consider the more basic elements and leave details to specialists; something that would also shorten the participation process.

Being an involving decision-maker

One of the great questions when engaging in a project such as this one is whether this is even something the decision-makers, who ultimately need to be the ones employing this method, want. With criticisms of participation being some of the main concerns of developers, it is easy to see why agencies might be inclined to forego this process as much as the law allows.

Through a theoretical review, along with arguments for how the world is changing; how access is becoming a given for all citizens, it has been made clear that not allowing participation, or doing participation through the lower rungs of Arnstein's ladder, can lead to lengthy and costly public scandals. Costly both in a financial and a political sense. In Denmark, one need only look at the many recent examples of scandals and how publically these have been broadcast to know the severity of this. Important political shifts in Copenhagen as a result of the process behind Amager Fælled; national debates sparking because an ex-politician (Uffe Ellemann) complained about the height of his neighbour's house and (maybe unjustly) won the case. Local experience from Aalborg's planning department number scandals in Gug Høje surrounding a permitted building by BIG architects that may be too high, and a local newspaper in Nibe in open media warfare with the department, claiming improper case-working by the municipality. Cases such as these mean significantly extended resolution times for the cases, potential political downfalls for the politicians involved, and huge financial costs for the developers whose sites sit waiting for a resolution.

All of the above scandals are a result of lacklustre citizen involvement, where the opinion of neighbours was neglected, or neighbours were not adequately informed on why the developments happened as they did. They happen more frequently, because citizens today can access the vast majority of documents in any given public case, and they can share their limited insights as the truth through public media. The one way to combat this is to be open and forthcoming, and as decision-makers create room for a controlled digital as well as physical debate about a project.

To add to the pile, theorists point to the fact that projects with strong participation give more popular and more well-used developments, able to persist for a longer time and garner the interests of more small businesses. While specialists are required for many parts of designing a development, thinking that knowledge of what people want sits best with specialist and not the people is naivë. Specialists know better often, but this knowledge should be utilised to nudge the opinion of the public in the right direction and design areas that solve their needs even if it was not in the way they first envisioned. It should not be utilised to forego those needs altogether.

Reflection

Learning outcome of the thesis

The choice of topic for the thesis carried its challenges on multiple fronts. First of, the subject itself, gamification, is far outside what is included in Urban Design AAU's curriculum. With no prior education in gamification, limited experience with user-involvement and primarily self-taught capabilities in the 3D representation of a design, a lot of the concepts explored in this thesis were wholly foreign, from the information itself to the researchers having conducted prior studies.

This meant starting from the bottom in the literary review, and much time spent researching different branches and fronts within the field.

Further, the end goal differed from typical projects. Past projects, while always based in literature, are largely a combination of artistic and rational decisions leading to a design. That was not the goal here. The topic of gamification is not yet mature to design, rather the concept itself should be explored. This left the process work in constant doubt about the end product, with nothing to compare it to.

There was however a particular goal with these problematic, yet intentional choices. With the freedoms of a master thesis project, comes the first opportunity to do something wholly different than the norm. The choice was made to explore the world of academia within architecture and design, and how new topics can be formulated and researched; with the goal of furthering an understanding of how working in this branch of the field would be.

The relation between practical and theoretical work cannot be understated, and with experience primarily in designing rather than theory development, it made sense to put the focus differently now; as such skills can see application both within and outside the academic world.

The choices left a project where much time went to getting acquainted with new fields, but that also allowed for, in a short time-frame, massively broadening perspectives on the complexities of how different fields intersect and gain valuable experience in how research projects can be conducted and how such a career might look.

Validity of research

As a result of the above, new methods had to be employed. Specifically, the interviews carry a need for some reflection. Following the advice of Ann Blandford et. Al, and Steinar Kvale, care was taken to prepare the interviews and have a well-defined plan of how the interviews would be analysed. Interview questions were rehearsed, without ever making them a set manuscript to allow for improvisation and unpredictable answers from interviewees. However, conducting interviews is an immensely complicated process, and as Kvale states:

"*In several professional contexts, intensive training of the interviewers may be required. Authorization to conduct psychoanalytic interviews requires years of training.*" (2007, p. 18)

Assuming no faults in the interviews would be naivë, and upon analysing the transcriptions, multiple faulty questions and missed opportunities for follow-ups were identified, just as some plans for the analysis process had to be changed. That said, it is a satisfying result to not end up where literature forewarned an amateur attempt at interviewing could end: With lots of data not able to be used for anything concrete.

The data from the interviews were usable and did manage to express tendencies on the topic investigated. As such, while by no means a flawless process, it still was partly successful, and much experience in how such methods may be employed in future projects was gained.

The faults combined with a relatively small group of interviewees does make it challenging to draw generalising conclusions from the interviews, but their consistency makes it easy to see clear tendencies. This can be used as key argumentation for conducting future more extensive surveys and experiments.

Evaluation of topic

With the drawn conclusions on the topic, it is now time to consider the value of the research and the topic itself; is it worth looking into?

The indications from the interviews and what was learned from theory taught two lessons:

First, the topic is heavily under-researched, with most research focusing on the much more complex custom games. This thesis took the first steps towards the research of the effect of existing games and their feasibility for use in participation processes, but the limited scope of the project leaves many aspects still shrouded. In particular, research on introducing gamification in different stages of the participation process would be interesting. This thesis had to mimic the employment time with the time the public hearing was held in the Budolfi case to be able to compare results. The project was further challenged by timing, in the sense that many different cogwheels had to align for the 3½ month thesis to align with a participation process and allow using the gamification method in a real setting. The limits of having to adhere to municipal project times were not possible to follow, and so the project was brought into this mimicked reality rather than following a real process.

This does decrease validity some, and it would be good for the project to see a repeated version in a real setting working together with an agency to see if the results remain as positive.

Secondly, on the topic of the positive results. Regardless of the above, and what is yet to be investigated within the topic, the results were overwhelmingly positive. However, the theory did suggest such results might be the case, with words on how the blocky nature of Minecraft might not be a problem and how using a platform known to the user is essential. There can remain little doubt that this is a topic worth looking into, and knowing the numbers of gamers worldwide and how translating information through games becomes second nature to more and more, it is tough to imagine a world where gamification of various fields will not play a significant role. As such the topic should see continued attention, as to not let urban design fall behind on this.

Future research

With this initial look at Minecraft and general affirmation of gamification using exciting games is a valid way to go with future participatory processes, the need arises for both expanding the results of this research and include other existing games.

For instance, it remains unclear if any sandbox games can achieve what Minecraft can, or maybe even more. To uncover this, further and more extensive experiments with Minecraft should be conducted and comparative tests of other platforms likewise.

More important, however, is to further the understanding of how these gamification tools are best employed. To able to compare to the process at Budolfi, this thesis employed the tool much in the same way and at the same stage of the process as the conventional hearing is employed. As previously mentioned, this does not necessarily move the process further up Arnstein's ladder; it merely means the inclusion of more citizens. Utilising the tools earlier in the process, and allowing co-creation in the sketching-phase by allowing citizens to contribute their own 3D models made through the game, could be a very interesting way to allow citizens to easily participate at a much earlier stage, without disturbing the process too much.

Inspiration could be drawn from citizen creations, and time would not be wasted designing something very far from what the citizens have in mind. The effectiveness of this, however, and whether or not citizens are even capable of producing early volumetric sketches like that remains unclear. Future explorations of gamification in Urban Design should be employed earlier in the development process and carried through the entirety of it. That way the full context of using gamification in development can be understood.

Lastly, as mentioned in the introduction, and as is luckily already happening, it has to be researched how non-specialists can derive spatial understanding from games, what kind of graphics is most effective at this, and how games can best allow citizens to communicate the complex thoughts spiring through the use of games.

Literature

Aalborg Kommune (2015)'Bilag: Opsamling på fordebat af Budolfi Plads april/maj 2015' Aalborg Kommune, By- og landskabsforvaltningen.

Aalborg Kommune (2017) 'Lokalplan 1-1-117 høringssvar' Aalborg Kommune, By- og landskabsforvaltningen. Unpublished

Arnstein, S. R. (1969) 'A Ladder Of Citizen Participation', Journal of the American Planning Association, 35(4), pp. 216–224. doi: 10.1080/01944366908977225.

BBC Technology (2012) Minecraft to aid UN regeneration projects, BBC. Available at: https://www.bbc.com/news/technology-20492908 (Accessed: 11 March 2019).

Blandford, A., Furniss, D. and Makri, S. (2016) Qualitative HCI research. Morgan & Claypool.

Block by Block (2017) Building a model for participatory urban planning in Nairobi. Available at: https://www.blockbyblock.org/projects/nairobi (Accessed: 11 March 2019).

von Borries, F., Walz, S. P. and Böttger, M. (2007) Space Time Play: Computer Games, Architecture and Urbanism, Architecture. Berlin: Birkhäuser. Available at: http://www.spacetimeplay.org/.

Brigham, T. J. (2015) 'An Introduction to Gamification: Adding Game Elements for Engagement', Medical Reference Services Quarterly. 2015, 34(4), pp. 471–480. doi: 10.1080/02763869.2015.1082385.

Carver, S. (2003) 'The Future of Participatory Approaches Using Geographic Information: developing a research agenda for the 21st Century', URISA Journal, 15, pp. 61–71. Available at: http://www.iapad.org/wp-content/uploads/2015/07/the_future_of-part_approaches_using_gis.pdf.

Christie, V. and Berger, M. (2017) 'Game Engines for Urban Exploration: Bridging Science Narrative for Broader Participants' in 'Playable Cities: The City as a Digital Playground'. Edited by A. Nijholt. Singapore: Springer International Publishing. doi: 10.1007/978-981-10-1962-3.

Cogan and Sharpe (1986) '"The Theory of Citizen Involvement" in Planning Analysis: The Theory of Citizen Participation'. University of Oregon, pp. 284–285. Available at: https://pages.uoregon.edu/rgp/PPPM613/class10theory.htm.

Devisch, O., Poplin, A. and Sofronie, S. (2016) 'The Gamification of Civic Participation: Two Experiments in Improving the Skills of Citizens to Reflect Collectively on Spatial Issues', Journal of Urban Technology. Taylor & Francis, 23(2), pp. 81–102. doi: 10.1080/10630732.2015.1102419.

DTU (2018) Transportvaneundersøgelsen - TU. Available at: http://www.cta.man.dtu.dk/transportvaneundersoegelsen.

Enscape (2015) Enscape. Available at: https://apps.autodesk.com/RVT/en/Detail/Index?id=2629595860167800202&appLang=en&os=Win64 (Accessed: 11 March 2019).

Erhvervsstyrelsen (2018) Planlov og planlægning. Available at: https://erhvervsstyrelsen.dk/planlov-og-planlaegning-0 (Accessed: 19 February 2019).

Gade, A. (2019) 'Case study as a method', in Intership for AirCiF. 1st edn. Aalborg.

Games for Cities (2011) Betaville, GamesforCities. Available at: http://gamesforcities.com/database/betaville/ (Accessed: 11 March 2019).

Games for Cities (2016) Cities: Skyline. Available at: http://gamesforcities.com/database/cities-skylines/ (Accessed: 11 March 2019).

GamesforCities (2012) BlockbyBlock. Available at: http://gamesforcities.com/database/block-by-block/ (Accessed: 11 March 2019).

Gilbert, B. (2018) 'Minecraft' is still one of the biggest games in the world, with over 91 million people playing monthly. Buisness Insider. Available at: https://www.businessinsider.com/minecraft-has-74-million-monthly-players-2018-1?r=US&IR=T [Accessed: 10/05/2019]

Goncharov, A. (2011) 'Public Space Report: CROWDSOURCED MOSCOW 2012" A Public Space Game', pp. 82–90. Available at: http://strelka.com/en/research/project/crowd-sourced-moscow-2012-a-public-space-game-2011.

Growth Engineering (2018) THE BIRTH OF GAMIFICATION (HISTORY OF GAMIFICATION PT.2). Available at: https://www.growthengineering.co.uk/the-birth-of-gamification-history-of-gamification-pt-2/ (Accessed: 19 February 2019).

Haahtela, P. et al. (2015) 'Gamification of Education: Cities Skylines as an educational tool for real estate and land use planning studies', Aalto School of Engineering Spring, pp. 0–13. Available at: https://aaltodoc.aalto.fi/bitstream/handle/123456789/17843/S__haahtela_pyry_2015.pdf?sequence=1&isAllowed=y.

HART, C. (2018), 'Doing a Literature Review: Releasing the Research Imagination'. Thousand Oaks, SAGE.

Hays, R.T. (2005) The effectiveness of instructional games: A literature review and discussions. Naval Air Warfare Center Training Systems Divisions (No 2005-004)

Hunicke, R., LeBlanc, M. and Zubek, R. (2004) MDA: A Formal Approach to Game Design and Game Research.

Højlund, K (2019) Interviewed by August Gade and Camilla Bech, 12th of April. Available at: QR-code 03 (available until 07.06.2019)

Johnson, R. B. and Onwuegbuzie, A. J. (2004) 'Mixed Methods Research: a Research Paradigm Whose Time Has Come', pp. 1–14. Available at: papers2://publication/uuid/5E239877-2A92-4049-88AE-B1CD20D6AB1B.

Kapp, K. M. (2012) The gamification of learning and isntruction. 1st edn. Pfeiffer

Ke, F., (2009) A qualitative meta-analysis of computer games as learning tools. In R.E. Ferdig, Effective electronic gaming in education (Vol. 1, pp. 1-32). Hershey, PA: Information Science

Kvale, S. (2011) Introduction to Interview Research, Doing Interviews. doi: 10.4135/9781849208963.n1.

Laing, R. (2019) Digital Participation and Collaboration in Architectural Design. 1st edn. London: Routledge.

Lang, R. (1986) Integrated Approaches to Resource Planning and Management. 1st Ed. Calgary: The University of Calgary Press.

Lipscombe, D. (2018) Remaking a children's hospital in Minecraft, eurogamer. Available at: https://www.eurogamer.net/articles/2018-10-24-remaking-a-childrens-hospital-in-minecraft (Accessed: 11 March 2019).

Mapuva, J. (2015) 'Citizen Participation, Mobilisation and Contested Participatory Spaces', 3(10), pp. 405–415. doi: 10.14662/IJPSD2015.052.

Marsh, J., Molinari, F. and Trapani, F. (2013) 'Co-creating Urban development: A living lab for community regeneration in the second district of palermo', Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), 7973 LNCS(PART 3), pp. 294–308. doi: 10.1007/978-3-642-39646-5_22.

Masser, K. and Mory, L. (2018) The Gamification of Citizens' Participation in Policymaking. Cham, Switzerland: Springer Nature.

Maxis (2014) SimCity. Available at: https://www.ea.com/games/simcity/simcity (Accessed: 11 March 2019).

McDonough, J. and McDonough, S., (1997). Research Methods for English Language Teachers. London: Arnold.

Medyckyj-scott, D. (1992) 'Human Spatial Cognition: Its Relevance to the Design and Use of Spatial Information Systems', 23(2), pp. 215–226.

Mehul Bhatt, Christoph Hölscher, T. F. S. (2012) 'Spatial Cognition for Architectural Design', Spatial Cognition for Architectural Design SCAD 2011 Symposium Proceedings, (029).

Parker, B. (2003) Planning Analysis: The Theory of Citizen Participation, University of Oregon.

Poplin, A. (2011a) 'Games and serious games in urban planning: Study cases', Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), 6783 LNCS(PART 2), pp. 1–14. doi: 10.1007/978-3-642-21887-3_1.

Poplin, A. (2011b) 'Playful public participation in urban planning: A case study for online serious games', Computers, Environment and Urban Systems. Elsevier Ltd, pp. 195–206. doi: 10.1016/j.compenvurbsys.2011.10.003.

Putnam, R. D. (2000) Bowling Alone. Simon & Schuster.

Randel, J.M., Morris, B.A., Wetzel, C.D., and Whitehill, B.V. (1992) The effectiveness of games for educational purposes: a review of recent research. Simulation and Gaming, 23(3), 261-276

Rytter, K. and Thuesen, J. (2019) Interviewed by August Gade and Camilla Bech, 8th of March. Available at: QR-code 03 (available until 07.06.2019)

Sander, T. H. and Putnam, R. D. (2009) 'Still Bowling Alone?: The Post-9/11 Split', Journal of Democracy, 21(1), pp. 9–16. doi: 10.1353/jod.0.0153.

Sarracino, F. and Mikucka, M. (2015) 'Social capital in Europe from 1990 to 2010: Trends, path-dependency and convergence', Munich Personal RePEc Archive.

Schnabel, M. A., Lo, T. T. and Aydin, S. (2014) 'Gamification and Rule Based Design Strategies in Architecture Education', Conference Paper, (DECEMBER), pp. 1–11. doi: 10.13140/2.1.5150.3689.

Shapescape (2019). Available at: https://shapescape.co/ (Accessed: 6 March 2019).

Statista (2019) Number of active video gamers worldwide from 2014 to 2021.
Available at: https://www.statista.com/statistics/748044/number-video-gamers-world/ (Accessed: 4 March 2019).

Steinmann, R., Krek, A. and Blaschke, T. (2004) 'Can Online Map-Based Applications Improve Citizen Participation ?', International Federation For Information Processing, (12/02), pp. 25–35. doi: 10.1007/978-3-540-32257-3_12.

Stuart, K. (2015) Climate Hope City: how Minecraft can tell the story of climate change, The Guardian.
Available at: https://www.theguardian.com/environment/keep-it-in-the-ground-blog/2015/jun/12/climate-hope-city-how-minecraft-can-tell-the-story-of-climate-change (Accessed: 6 March 2019).

Tellis, W. M. (1997) 'Introduction to Case Study', Case Study Research in Software Engineering, 3(2), pp. 127–132.
doi: 10.1002/9781118181034.ch9.

Thiel, S. and Ertiö, T. (2018) User Centric E-Government. Springer International Publishing. doi: 10.1007/978-3-319-59442-2.

Thiel, S.K. and Ertiö, T., (2018) Play It to Plan It? The Impact of Game Elements on Usage of a Urban Planning App. In Saeed et Al User Centric E-Government, 203-229

UNECE (2017) The UNECE convention. Available at: https://www.unece.org/env/pp/introduction.html (Accessed: 21 February 2019).

Valdimarsson, E. (2018) Pendler: ››Jeg går fra huset ti minutter i seks om morgenen, og hvis alt går snorlige, er jeg på kontoret klokken halv ni‹‹, Politiken. Available at: https://politiken.dk/forbrugogliv/art6336305/»Jeg-går-fra-huset-ti-minutter-i-seks-om-morgenen-og-hvis-alt-går-snorlige-er-jeg-på-kontoret-klokken-halv-ni« (Accessed: 19 February 2019).

Vogel, J.J., Vogel, D.S., Cannon-Bowers, J., Bowers, C.A., Muse, K. and Wright, M. (2006)
Computer gaming and interactive simulations for learning: A meta-analysis. Journal of Educational Computing Research, 34(3), 229-243

Vigelini, M. (2017) The City of Florence, Minecraft EDU.
Available at: https://education.minecraft.net/lessons/the-city-of-florence-italy/ (Accessed: 11 March 2019).

Wakefield, J. (2017) Video game Cities Skylines helps plan Stockholm's development, BBC News - Technology.

Wiedemann, P. M. and Femers, S. (1993) 'Public participation in waste management decision making: Analysis and management of conflicts', *Journal of Hazardous Materials*, 33(3), pp. 355–368. doi: 10.1016/0304-3894(93)85085-S.

Wikipedia (2019) Millennials. Available at: https://en.wikipedia.org/wiki/Millennials (Accessed: 14 March 2019).

Wolfe, J. (1997) The effectiveness of business games in strategic management course work. Simulation and Gaming, 28(4), 360-376

Yin, R. K. (1984) 'Case Study Research: Design and Methods', Acta Psychiatrica Scandinavica, 89(s381).
doi: 10.1111/j.1600-0447.1994.tb05843.x.

Zainal, Z. (2007) 'Case study as a research method', Faculty of Management and Human Resource Development, 97(1), pp. 81–134.
doi: 10.1515/klio-2015-0004.

Illustrations

Illustration 1:	Own photo.
Illustration 2-3:	Own illustration.
Illustration 4:	https://adage.com/creativity/work/fun-theory-piano-staircase/17522
Illustration 5:	Own illustration.
Illustration 6:	https://nordjyske.dk/nyheder/syv-aars-planer-saadan-skal-budolfi-plads-se-ud/e9901973-e63b-45a7-a87a-f3f5033c2d77/gallery
Illustration 7-9:	Own illustration.
Illustration 10:	Own photo.
Illustration 11-14:	Own illustration
Illustration 15:	https://www.blockbyblock.org/projects/nairobi
Illustration 16:	https://www.youtube.com/watch?v=srEYVBA6OD0
Illustration 17:	https://shapescape.co/projects/gosh
Illustration 18:	http://gamesforcities.com/site/assets/files/1052/header_betaville.jpg
Illustration 19:	https://shapescape.co/projects/florence
Illustration 20:	https://ksassets.timeincuk.net/wp/uploads/sites/54/2018/09/NSwitchDS_CitiesSkylinesNintendoSwitchEdition_01-920x518.jpg
Illustration 21:	Own illustration.
Illustration 22:	Own photo.
Illustration 23-27:	Own illustration.
Illustration 28:	Own photo.
Illustration 29:	https://nordjyske.dk/nyheder/syv-aars-planer-saadan-skal-budolfi-plads-se-ud/e9901973-e63b-45a7-a87a-f3f5033c2d77/gallery
Illustration 30-31:	Own illustration.
Illustration 32:	https://shapescape.co/projects/immersion-chicago
Illustration 33:	https://wrw.is/category/software/enscape/
Illustration 34:	https://www.archdaily.com/catalog/us/products/14225/best-practices-video-creation-enscape
Illustration 35-36:	Own illustration.
Illustration 37:	https://www.researchgate.net/figure/The-B3-Game-user-interface-18_fig7_221433226
Illustration 38:	https://www.seriousgamemarket.com/2011/07/serious-games-in-urban-planning-for.html
Illustration 39:	https://www.instagram.com/p/BuZAAnYHSeq/
Illustration 40:	http://modthesims.info/t/607975
Illustration 41:	https://www.solidsmack.com/cad/google-blocks-vr-app-3d-modeling-tilt-brush/
Illustration 42:	https://vrscout.com/news/blocks-google-vr-3d-modeling/
Illustration 43:	Own photo.
Illustration 44:	Own illustration.
Illustration 45:	https://www.aalborg.dk/om-kommunen/byplanlaegning/byudvikling/budolfi-plads
Illustration 46:	Own illustration.
Illustration 47:	https://www.aalborg.dk/om-kommunen/byplanlaegning/byudvikling/budolfi-plads
Illustration 48-54:	Own illustration.

Appendix 01, Case-study table

This text describes the parameters chosen and elaborates why specific weights and points were given. Weighs are generally based on assumptions and knowledge drawn from theory, while points are based on the individual games case-study.

Realism is how realistically a game represents a design. This naturally matters in how it is perceived; however, theory informs that it matters less than what could have been assumed and that players are able to extract information from simpler representations. In fact, complex realistic representations may have a negative impact, hence the weight of 1.

Interactivity weights 3, as theory informs us this is very important to players learning and so understanding of what is shown. The platforms with the most freedom, allowing the player to interact with most elements are rated highest.

VR readiness is included as it is a benefit, and even further immersion can be achieved this way. It is however, not an important metric, as most citizens will not have the equipment to utilise this yet; it may be more important in a few years. The Sims gets a rating of two, becomes the game can partly be played in VR but not fully.

Versatility is the platforms ability to work on varying types of site, both in scale and content, for instance, big parks vs small houses. This is of medium importance, it is imperative it can be used on multiple locations to cut down pricing, but not necessarily on every kind of site.

Price is very important, as it has disqualified such projects before. This is the price the agency or the citizen have to partake combined with the estimated cost of producing a model in the platform. For instance, Enscape runs on expensive programs and requires professionals to make a model, where Minecraft is relatively cheap, and non-professionals can make the models. Further, platforms such as Google Blocks that require VR equipment are ranked as high, even though it is cheap if the VR equipment is already owned. A high rating means a low price.

Simulation of life is how well the platform can emulate life in the model. This is assumed to have some importance, but it is unclear how much. Platforms that automatically simulate this receive three points, two points goes to those where it can relatively simply be coded in, and one to games where it is impossible or very complicated to add.

Usability for the developer is how easy the program is to work with as a professional and how well the platform can be tuned to the sort of representation the developer wishes. Programs with many restrictions are difficulties in modelling many different sites receive low ratings. This is important for easing the use of a platform for participation.

Ease of use for the citizens, similar to the above, but on the citizen end. Simple systems with simple controls are the goal. Enscape receives two points only because the phone-mode allows very easy use. The full experience, however, is very challenging to those foreign to the software.

Easily accessed/installed from home is vital, as anything else could discourage citizens who would like participating from doing so. Platforms that require VR score low, as installation of this is a complication.

Easily provide relevant information is only of medium importance, as the same information could be conveyed outside the platform. The rating describes the games ability to have text and/or graphical material presented from outside the game, like descriptions and conventional image material

Possibility for feedback to decision-makers is the games ability to allow citizens to provide feedback within the platform. This is of medium importance, as feedback could otherwise be sent in separately through text. A rating of two represents in-game options for textual feedback, while a rating of three means the allowing of citizens to make their own spatial changes to the proposal.

Easy to set up for developers, is for when the platform is utilised at a hearing. Setting up of VR can fail even for professional (such as experienced as Architema, while the presentation of just images hardly can go wrong. A rating of three means that start the game is very simple, and few problems should be able to occur. Enscape is rated at two because the phone setup is very easy to use, even if the launching of the full experience is complex.

Possibility for citizens to study it by themselves is the ability for participants of the hearing to play around with the model themselves without oversight. If a guide is needed at every station, this complicates using the platform in this way. VR equipment will typically need a guide.

Appendix 02, QR codes

QR code 01: Interviews

QR code 02: Minecraft model

QR code 03: Specialist interviews

QR code 04: Budolfi conventional material

Appendix 03, Questionnaire

Spørgeskema

I forbindelse med specialet omkring spil i borgerinddragelse bedes du udfylde dette spørgeskema. Spørgeskemaet består af tre dele; kontakt, spørgsmål om spil og borgermøder.

* Required

1. **Alder***:

_____

2. **Uddannelse***:

_____

Digitale spil

Har du spillet meget computer, tablet eller konsol spil? Og hvis du har hvilke?

3. **Har du i perioder spillet digitale spil før?***:
   - ☐ Nej / meget lidt.
   - ☐ Ja, op til 0-5 timer om ugen.
   - ☐ Ja, op til 6-15 timer om ugen.
   - ☐ Ja, op til 16+ timer om ugen.
4. **Hvilke spil har du primært spillet?**:

_____

5. **Har du spillet Minecraft før?***:
   - ☐ Nej / meget lidt.
   - ☐ Ja, op til 0-5 timer om ugen.
6. **Spiller du stadig digitale spil din fritid?***:
   - ☐ Ja, meget.
   - ☐ Ja, lidt.
   - ☐ Nej.

Borgermøder

7. **Har du deltaget i et borgermmøde før?***:
   - ☐ Ja.
   - ☐ Nej.
   - ☐ Ved ikke.
8. **Vil du deltaget i et borgermmøde i fremtiden?***:
   - ☐ Ja.
   - ☐ Nej.
   - ☐ Ved ikke.
9. **Vil du deltage, hvis det kan gøre hjemmefra?***:
   - ☐ Ja.
   - ☐ Nej.
   - ☐ Andet: _____
10. **Hvorfor har du/har du ikke deltaget i et borgermøde?***:

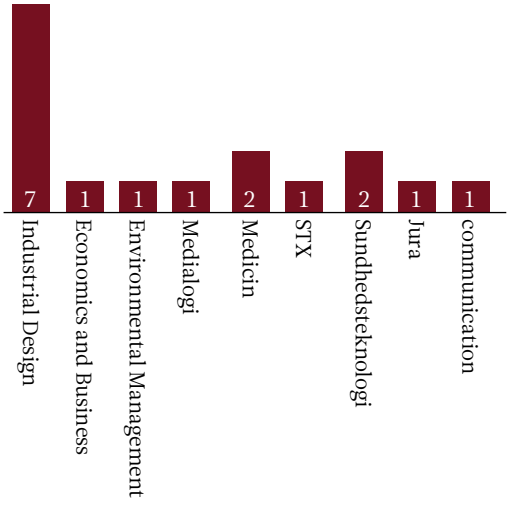
_____

Appendix 04, Questionnaire answers

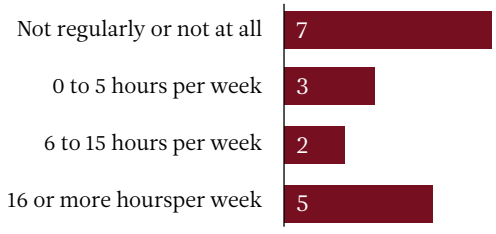
1. Age:

Average age 25

2. Education:



3. Have you in periods played digital games before?

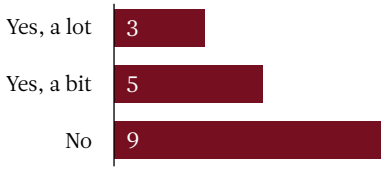


4. Which games have you primarily played?:

The Sims, Leauge of legends, wold of warcraft, minestryger, Minecraft, CS 1.6, MARIO, Tekken, Crash, RTS, FPS Shooter, RPG, SimCity, bilspil, platformspil, Counter Strike, FIFA, NBA2K19, CSGO, LOL, WOW

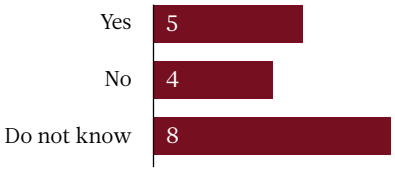
5. Have you played Minecraft before?

6. Do you still play digital games in your spare time?

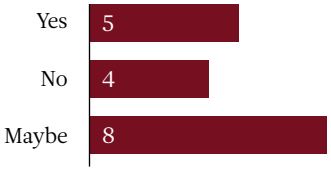


7. Have you participated in a public hearing?

8. Do you want to participate in a public hearing in the future?



9. Do you want to participate, if it can be done from home?



10. Why have you/have you not participated in a public hearing?

- Jeg har ikke oplevet en sag som har været så relevant og vigtigt at jeg har tænkt at et borgermøde ville ændre noget som var vigtigt i min dagligdag.
- Bla. fordi at borgermødet ikke er blevet præsenteret som et muligt handlings-intativ. Endvidere fordi, at der ikke har været en sag der har syntes særlig vigtig for mig, på et borgermøde.
- Jeg tror ikke, at jeg har vidst hvornår det fandt sted.
- Har ikke fundet det relevant.
- Ved ikke hvad borgermøde er.
- Ikke relevans.
- I forbindelse med opstilling af kystnære vindmøller.
- ikke fået tilbudet.
- Manglende interesse.
- i forbindelse med valg.
- Emnerne har sjældent omhandlet noget, der har været så lokalt, at det har vakt min interesse, og hvor jeg har følt, at jeg har haft et potentiale for at bidrage innovativt.
- Det har ikke umiddelbart haft min interesse.
- Tror ikke på demokrati.
- De har ikke virket relevante.
- Har ikke vidt hvad det var og at man kan deltage i det.
- Manglende oplysninger.
- Pas.