

GAMIFICATION IN URBAN DESIGN FOR UPGRADING THE INFORMAL SETTLEMENTS (OPEN PUBLIC SPACE) IN AFRICAN NEIGHBORHOODS

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ABSTRACT

The city and architecture of today and the future will face and are facing the challenge of innovation. Simultaneously, Informal African neighborhoods; present challenges to human sustainable development and equity, safety, environmental quality, and resiliency issues. As ICT becomes pervasive, architects have to rethink rules for communication between the citizen and physical urban space. Accordingly, the digital participation integration in specific Serious Games can be a tool to empower slum residents and engage communities to participate in settlement upgrading design based on SDG 11.

Thus, the proposed paper will present an overview of the participatory gamification technology involved in civic engagement in informal African neighborhoods that fosters engagement and democratization. The research reaches from Literature review on some Gaming tools and participatory process Articles. Moreover, to achieve the goals, a detailed study on; authors and the extensive research of HABITAT on informal settlements and the United Nations, qualitative data analysis methods to organize and interpret the collected research findings.

This analysis showed that Gaming tools and Gamification as a methodology; helps to; empower any residents with different knowledge to participate in settlement upgrading design in specific Minecraft can foster engagement, make cities and human settlements inclusive, safe, resilient, and sustainable with communities of different ages and specifically women and children without any expertise and knowledge.

KEYWORDS

Gamification; Informal settlements; Participatory technology development; Public Space; Civic Engagement

INTRODUCTION

In the post-industrial era, cities translated to a human scale, both in physical form and how citizens participate in making decisions and developing their city (Bergh, 2013). By the late 1970s and 80s, participatory architecture got shaped. Scandinavians Pioneered in the 1930s, and Britain and Australia in the 1960s movement gai-

ned ground on both sides of the Atlantic (Jacobs, 1961; Wates & Knevitt, 1987). Portuguese experience SAAL in the 1970s was a fruitful experience too. To participate in settlement planning and upgrading including, the management of new infrastructure, undoubtedly requires action at the political level but, we cannot hesitate the architect role to society aim to provide lasting solutions to specific needs and, the active participation of the community is needed (Lepik, 2010).

In decades, cooperation developed among spatial practitioners such as architects, urban planners, which produced a particular landscape of projects that engage IT (Information technology) as a catalytic tool for interactions in the physical urban space (Del Signore, 2018). Civic Tech, participatory technologies, and digital collaboration have gained increasing interest in urban planning. (Steinberg, 2014; Pezzica, Lopes & Paio, 2017; Mitchell, 1999; Sassen, 2005; Castells, 2010; Ermacora, 2016; Ratti, 2014). Simultaneously, African countries are integrating; technology-based tools Information and communications technology (ICT) at the center of global socio-economic transformations (Leader, 2013; Norbrook, 2015; Maria Efreire, 2014). As ONU Secretary states: The United Nations system will support the use of new technologies. We must work closely with new and current partners to overcome challenges and reconcile interests, especially in privacy and human rights, ethics, equality and equity, sovereignty and responsibility, and transparency and accountability. Moreover, As Maimunah Shariff, UN-HABITAT Executive Director (Smart City Expo, 2020), argues the essentiality to promote technology utilization within African countries and informal settlements for upgrading lives, especially public spaces. Once people create their own space, they will not vandalize it, and citizens will feel a sense of belonging. Accordingly, ICT, mobile, and digital participatory technologies are helping the empowerment of slum residents and their youth to have greater control over their lives, communities through access to information and knowledge (Doherty, 2012) and also often considered to provide new opportunities to engage citizens and improve the quality of political deliberation and decision. Besides all, it is worthwhile to visualize ideas, thus promoting shared understanding and facilitating interaction between citizens and government. For example, crowdsourcing data can provide; opportunities for urban citizen observatories that crowdsource urban information, which can be important for policymakers. In the focus of the urban design, various approaches developed to target the active participation of citizens through gamification technology. In this context, this study presents an overview of the participatory gamification technology involved in civic engagement in informal cities. The final contribution of this paper is a theoretical framework to evaluate some serious games and their possible applications in planning processes to implement inclusive approaches towards getting all actors, including communities, involved in decision-making and planning for interventions. The paper outcomes will demonstrate that Information technology and digital media are tools for making urban places (Devisch et al., 2018). Moreover, the technology and tectonic tools can penetrate the public realm and territories to change the existing socio-economic issues by citizen's knowledge and awareness. In particular, the usage of participatory technologies to build a better sustainable environment such as video gaming applications, AR/VR reality technics, or digital fabrication.

PLACEMAKING AND PUBLIC SPACES

Space is no longer considered a neutral backdrop for people's lives as space becomes a place when endowed with meaning and value (Cho, 2011; Tuan, 1979). Place values are in the physical and social environment in which; relationships are constructed (Friedmann, 1987). It suggests that place incorporates physical dimensions, social relations, symbolic meanings, and subjective human experiences (Schofield, 2011). Placemaking influences the physical form of urban space and the method communities interact with one another (Schneekloth & Shibley, 1995). Place-making is considered an empowering process during which people are; involved in renovating, maintaining, and representing the places where they live (Heald, 2008; Jordan, Puren, & Roos, 2008; Schneekloth & Shibley, 1995). Place-making implies that places are not products of deliberate intervention such as Spatial Planning, which involves active and ongoing community participation. Therefore, places cannot be designed from the; outside (e.g., by experts) (Friedman, 2007). Active involvement of communities is; especially important when making decisions concerning their living environment (Holmes, 2011) as involving communities in decision-making gives them a feeling of ownership and re-responsibility towards their environment (Eden, 1996) and ultimately improves their quality of life (Lipietz, 2008).

Public space has often been overlooked and undervalued by urban authorities but is increasingly being considered the backbones of the city and sustainable living. Public space is accessible and enjoyable by everybody without a profit motive and takes on various spatial forms, including parks, streets, sidewalks, markets, and playgrounds. Upstanding public spaces enhance community cohesion and promote health, happiness, and well-being for all citizens (Pérez et al., 2017). Open spaces are vital in low-income, high-density residential environments, African countries, and informal settlements as they are prominent public places that form the heart of a community's social lives (Strydom & Puren, 2011). This Citizen involvement may also help produce policies with greater public acceptability and improve trust in government; while promoting the personal growth of participants (Yang, 2011). Community participation at least has two effects by creating an understanding of the socio-spatial dimensions that underlie space and formulating suggested intervention strategies to address the needs and desires of the community (Strydom & Puren, 2011).

DIGITAL TOOLS IN PARTICIPATORY DESIGN

Although ICT and citizen participation in urban planning design is still a young field, more research is needed to study its social impact (UN-Habitat, 2015). But still, technology and social media can play a role in initiating, guiding the condition that they are open enough to allow for collective experimentation (Devisch et al., 2018). To develop a public realm, neighborhood, a barrio by technology, the first tool is data. Architects and decision-makers will be the data users. Moreover, citizens will be the Data collectors in this system. A citizen can get aware of individual impacts on themselves. Participatory technology designs offer the city and citizens new opportunities (Bergh, 2013). Examples such as Block by Block, Toolkit, community empowerments, BIPZIP, and others are evidence of the importance of both tech-

nology and the engagement of communities. Diverse ways exist to bring citizens into an experience during the public participation process, e.g., using 3D environments, GIS-based technologies, Augmented reality (AR), or Gaming tools (Gordon E. S., 2010).

Visualization techniques such as AR offer a range of innovations to support informational purposes. For instance, mobile devices can display urban design planning projects in existing landscapes (Höffken, 2015). With AR technology, can transform a 2D development plan into 3D for a better understanding among non-professionals. Or improving ordinary city walks by displaying additional information of buildings is also possible (Broschart, 2015). For example, VEUS is an app for participatory design processes that uses AR to allow a seamless and constant dialogue between the municipality and the citizens. This application is to enhance participatory processes in urban design. How does it work? After the login process and some personal questions related to age, gender, and more. Three; screens you can access; The map, where you can check what projects are available to vote around. A newsfeed site, where you can have an insight about the latest released projects and which shows other information such as its popularity (people already having taken part in the participation process); and the voting part. These consist of 3 main steps: info – showcasing three different projects for the site -, voting and adding elements to the voted project.

How do citizens use Venus? VEUS; is designed to convey citizens' information on urban design projects and ask them for opinions and suggestions. (Collection of Best Practices State of the Art Catalogue, 2020). But within the application citizens, will face a limit like objects which it preexists in the application, and you can toggle and choose among the options what you prefer and not what you want to have in your public space or neighborhood.

Using new technologies like Virtual Reality (VR) and AR, it is possible to work with defined urban interactively, rehearse various action strategies, and collaboratively evaluate public spaces. As urban planning processes are often complex and protracted, fostering public participation in this sector has to be seen as the main challenge (Kevin Klamert, 2017). Taking advantage of technology from visual simulation and virtual reality provides a delivery system for organizations to get closer to final users (Sanchez Sepulveda, 2019).

It is vital to comprehend how VR Technology that is applied accurately can be a tool to involve society and democratize decision-making in complex projects, like urban ones. Considering the basis of VR is to create an immersive experience and allow the user to interact with objects. In general, the results of this experience support the hypothesis that VR is an effective tool for representing urban design projects in participatory design processes with participants not familiar with the technology. The project with the VR model showed a higher level of spatial comprehension and a more precise understanding of the characteristics of the project than those who examined it using only technical drawings and 3D images. For example, participants could quickly identify the different zones in the park (e.g., kid area, walking area, open plaza); and describe the differences in pavement type or vegetation density. They could also give specifics about the color, quantity, and size

of the benches and playground equipment. In the case of the participatory design project, held by professionals from the Housing and Urban Planning of Chile, which followed the standard protocols for public projects results, were surprising. They chose a fixed, predetermined navigation path with a slow-motion pace proved; to be effective, reduced dizziness, disorientation, and visual discomfort. However, some elderly participants chose to sit, which was an unexpected request that created dissonance with the walking; and avatar movement. In this case, a stationary visualization scenario (e.g., pretending to be sitting on a park bench) would have given a more natural spatial perception.

Distraction Factors were affected by the nature of the experimental setup. Isolation (from their actual, physical environment) was not entirely successful, as the research design required the researcher to interact orally with the participants during the visualization process. The attention (on the VE stimuli) was limited not only by the researcher questions but also by the general noise levels during the experiment and the fact that participants were aware that was, being recorded and photographed or filmed. Finally, interface awareness was also an issue as several participants felt the HMD unnatural or uncomfortable. However, the study shows that many themes need to be re-investigated. First, it is necessary to study how to increase the number of sensory channels in the VEs to improve immersion and presence, including sound (ambient sound) and kinesthetic (ability to move) stimuli. For this, the use of the Gamified of a real space generates a virtual space and an urban environment of simulation in which it is possible to make dynamic experiments of participation and generation of ideas, uses, or changes that improve that space (D. Fonseca; et al.;2017).

Another example is the “Play the City” a board game; City Foundation implemented throughout 2012 in different places; Holland, Belgium, Turkey, and South Africa, based on a Word of Warcraft type game. The use of the SimCity game in its different versions in urban planning workshops highlights the case of Cape Town in 2013. In “Play the City” gaming use is as a problem-solving method bringing top down decision makers together with bottom up stakeholders. In the accessible environment of games, freed from the jargons, various ideas, plans and projects meet, conflict and collaborate towards negotiated outcomes. It is a method that allows participants to collaborate, learn and experiment in a realistic yet safe environment. This method allows experts to step outside their usual environment to think freely about ideas and scenarios that might help develop an integrated approach to new city development (Tan, 2021). Does a board game like “Play the City” is efficient for the informal settlements in Africa? Does it allow all the genders and generations to participate equally and evenly?

Gaming, playfulness, and mobile participation motivate people to engage in the public affairs research field on gamification offer solutions (Seaborn, 2015). It usually intends to create grateful and playful user experiences, motivate desired user behavior, and increase the joy of use. (Deterring, 2013). Therefore, the Gamification goal is to engage users to take desired actions and to solve real-world problems. Such as weakened economic and social infrastructure. In the Boardgame like “Play the City” the engagement, raising ideas, and motivation are the main key points but this

depends also on the cultural background and if women and kids are used to raising their voice and sharing thoughts and opinion.

According to SDG 11, youth are exposed disproportionately to urban poverty, and they frequently live in slums and informal settlements created by unplanned and compressed urbanization. That lacks primary services and poses safety, health, security risks, and social and economic problems. The public realm's use can solve problems, besides other different problematic conditions like environmental problems. (i.e., through participatory technologies). Creating new socio-economic values provides better public space. To empower the community by engaging them in participatory actions, aiming at the sustainability of the urban public realm. Place-making is considered an empowering process during which people get involved in renovating, maintaining, and representing their neighborhood (Heald, 2008; Jordaan, Puren, & Roos, 2008; Schneekloth & Shibley, 1995). It aims at redeveloping places with the use of the local community and while appreciating existing local assets. Lastly, place-making adds further steps are gathering ideas, such as programming and managing the place by local users, who feel the mental ownership of the space. Many aspects make planning developing through using more participatory practices. First of all, these are societal benefits that participatory planning brings (Boonstra, Boelens, 2011).

Furthermore, gamification strategies show the potential to raise curiosity for participation to improve long-term user motivation to participate. Commenting and rating design proposals, sharing ideas, or playing goal-related project missions can be rewarded with points or badges. Formats of discovery motivate people to explore their district to find urban issues of public interest. Conceptualizing a platform that facilitates participation in every stage of the urban planning process is challenging. A gamified crowdsourcing service that effectively collects contributions and ensures in-depth communication and feedback at an early stage; covers only one aspect of the process.

Over the past few decades, the phrase; community participation has gained increasing usage in academic literature, policy-making documents, and international conference papers as an element to attain sustainable development in African countries. Community participation is now an established principle when one observes issues dealing with decision-making to achieve sustainable development (Shackleton et al., 2002). As Hughes mentioned (2001), most developing, mainly African countries, vigorously employ a non-participatory approach for decision-making. There is a need to engage communities in Africa in participatory planning and budgeting. Games are increasingly put forward as tools to support such good participatory planning processes arouse interest, motivation, and engagement by connecting personal attributes with real-world scenarios making the voices of others heard in the planning process (Harviainen & Hassan, 2019).

City governments started adopting serious Gaming—games designed for a primary purpose other than pure entertainment as a strategy to increase the quality and functionality of participatory planning processes ever since the 1950s (Abt, 1969; Constantinescu, Devisch, & Kostov, 2017). Serious games are a form of Gaming because serious games are a specific sub-set of the meta-concept of Gamification.

Gamification encompasses the idea of adding game elements, game thinking, and game mechanics to learning content (Kapp, 2012). Games are a critical tool towards uplifting creativity and enhancing human potential as it is increasing engagement with various aspects of governance. The fun and psychological fulfillment individuals derive from gamified participatory artifacts stimulates civic engagement (Harviainen & Hassan, 2019; Kapp, 2012; Devisch, Poplin, & Sofronie, 2016).

Gamification has been put forward as a tool to support the process of civic participation that leads to sustainable civic engagement through a process of collective reflection (O. Devisch, 2016). This tool enables citizens to observe their environment and reflect collectively on spatial issues in their daily environment. The Gaming tools in urban planning processes are linked; to other citizen participation as the Blockholm - Stockholm, 2014-, a game based on Minecraft promoted by the Swedish Center for Architecture and Design of Stockholm that has invited 100,000 users, technicians, and experts in urban design and citizens to participate. Since 2012, Minecraft was used to engage communities all over the world – particularly young people, women and slum dwellers – in the design of their local public spaces, and have now reached more than 25 countries. Kenya, Peru, Haiti and Nepal are among the nations to have Block by Block-designed spaces (Morris, 2017).

MINECRAFT AS COMMUNITY PARTICIPATION TOOL

The Minecraft participation process can be; adapted based on the local context, the type of projects, the capacity of the implementing partner/s, education, and level of IT skills of community stakeholders and objectives. The projects implemented so far indicate that using Minecraft adds value to community participation processes. Power relationships are changed, communities are involved; in new ways, and the process presents vast opportunities to engage hard-to-reach groups, particularly young people. Therefore, UN-Habitat recommends the use of Minecraft as a community participation tool in all public space projects. Between 2012 and 2016, UN-Habitat implemented a global public space program; to influence the development and delivery of around 300 public spaces. The development process, participatory planning workshops were held with local communities members in which they provided input into the design and eventual implementation and management of the spaces. The projects were a partnership between UN-Habitat and local partners such as local authorities, non-governmental and community organizations. Minecraft for community participation in the regeneration of 1970s high-rise housing developments in Stockholm, Sweden, and public space design in Nairobi, Kenya, Les Cayes, Haiti, and Mexico City, Mexico. UN-Habitat promotes the applicability of Minecraft as a community consultation tool in a wide range of public space projects. However, it is worth noting that this is a brand new, innovative approach that is very much in the pilot phase. Video gaming is often considered more of male activity. It is therefore crucial that the involvement of women and girls is proactively encouraged in each project. The aim should be to have a 50/50 gender split in each workshop or organize separate workshops where women and girls can safely and securely put input into the models. As long as times and spaces, enabling women and young people to participate (UN-HABITAT, 2015).

CONCLUSION

In conclusion, Human Behavior, emotions, and interpersonal relationships are consequences of mental processes; by the many elements of public places. Abraham Maslow, a behavioral theorist who established the Hierarchy of Needs, physiological, biological, or aesthetic needs, the need for safety, love, belonging, and self-actualization, status, or esteem are the most vital variables in motivating behavior. Games, in this case, can engage citizens for multiple purposes with variable motivation. Playing the games generates spaces of social interaction and allows the strengthen of playable habits. Any digital technology scenario fosters various levels of engagement, environmental expectations but what raises the challenge more than the technology is the number of participants or the population-representative which; creates democracy. As more people get engaged in the co-creation process, as better the results get. Finally, citizens will not vandalize the final concrete project. Which in the case of AR, VR, Boardgame there are some limits which changes the final result ad are efficient enough for the slum as mentioned previously.

Besides this challenge, games can make complex topics accessible and comprehensible to citizens who are not experts. Especially; when it comes to the African neighborhoods and their informal settlements. In addition to this, games facilitate the interaction of the governors, stakeholders, and citizens as Minecraft does.

Minecraft game involves communities from different gender and generations to design the public space. This factor highlights the capability of the users. It Encourages social engagement, designing, inactive uses, and feels safe and relaxing once you are representing; your ideas through a game and have the confidence to choose what is necessary for the neighborhood and fosters the freedom of speech within a tool. Furthermore, Minecraft experiences; showed that the digital Lego game functions in Informal settlements, especially; in African neighborhoods, and it even helps; to foster; engagement. Moreover, we should not forget that no one knows a place better than someone who uses, lives space every day, or grew up in it. As architects, we should listen, understand and debate. And try to plan what, why, and how? Finally, the outcomes of this research are fundamental for the definition of set recommendations for enhancing inclusive and sustainable urbanization, capacity for participatory, integrated, and sustainable human settlement planning, and management (SGD 11 project goals). Moreover, to promote public spaces as a keystone for sustainable cities to ensure good quality of life for all. Through policy guides, capacity building, knowledge sharing, achieving advocacy work, and actual implementation (UN-Habitat, 2017).

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