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GAMING AS A DISEMBODIED EXPERIENCE OF THE CITY: FROM ASSASSIN'S CREED TO 'SMART LEARNER'

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Abstract

This paper explores the role of gaming as a learning tool in the design disciplines and suggests a methodology of work that bridges urban planning and virtually reconstructed environments. Building on the growing body of literature at the intersection of gaming, learning, and urban planning, the paper analyzes the simulation of the city of Rome in the Assassin's Creed video game and argues for the reliability of its morphology in relation to the real city. Along these lines, the paper confirms the didactic relevance to the transition from the real city to the digital one, allowing for the creation of a theoretical and empirical reflection on the method for use in an educational setting. The paper builds on the idea of how gaming offers a disembodied experience of the city, arguing for its didactic and social impact on a new generation of "smart learners."

Keywords

Disembodied experience, gaming, ICT in architecture & urban planning, smart learner

1. *Introduction*

The Covid-19 outbreak brought about many challenges in the traditional educational settings globally. In fact, in response to a period of complete lock down, many schools and colleges began looking for innovative ways to continue their learning agenda. Among the many available solutions, gaming has taken on an important role, given the many advantages it offers, all related to developing students' imagination and creativity (Fondo para el Desarrollo de los Pueblos Indígenas de América Latina y El Caribe, FILAC, 2020). Gaming constitutes a technological advancement that is directly connected to smart users and appears to offer numerous insights into architectural discourse. Apart from mere entertainment, gameful constructed environments invite users to learn about the city environment, interact with the space around them, socialize, and become familiarized with different cultural characteristics (Angelidou & Psaltoglou, 2019). This disembodied experience of the city suggests that the visualized content is not understood via human sensing as any cognitive experience of physical space (Dove, 2011); rather, it might be understood through perceptual symbols built in the simulated reality. The properties and information tied to these symbols, which are perceived as conceptual representations (Barsalou, 2008; Barsalou, Simmons, Barbey, & Wilson, 2003), instruct, inform, and build a user-interface interaction, forming a new smart space (Geropanta & Cornelio Marì, 2014).

With that background, this paper hypothesizes that in gameful environments, users receive extensive information related to architectural. As the user becomes the protagonist and leads the game(Waal, Lange, & Bouw, 2017), they become part of a twofold learning process: the user starts learning about the space of the gameful environment, while the character starts learning which spatial elements will help them pass the level. This means that both the user and their character become learners of the physical space. The problem is that very little has been written to define an architectural and scientific approach to analyzing and designing this physical space as it is simulated in video games.

The second hypothesis expands out to suggest that in gameful city environments, users are active participants with the cultural heritage, material, or immaterial quality of a place, living an enhanced and personalized smart experience.

This also means that using video games to study certain localities might be a way to overcome the difficulty that users have in accessing them physically. It is in this way that game users turn into a completely new visitor; one that is available and happy to leave their data as a repository for other visitors. We argue that this process creates a bridge between gaming and an experience of the city that is at once augmented, enhanced, and technologically constructed.

Following this premise, this article analyzes how the emerging new roles that users acquire in gaming may affect the way architecture is taught today and how this knowledge can become a strategy for the city planning.

Specifically, we provide a case study taken from the *Ancient Rome* game in *Assassin's Creed: Brotherhood,* presenting how: a) spatial realism is treated in the game, and whether it can become teaching material. Secondly it explores b) how the game enables behavioral changes for users, transforming them into what we have defined as "smart students." Lastly, the article covers c) how gaming might assist the work of cities in obtaining better knowledge of outbreaks while creating an empowered community.

As a whole, this research marks the passage from the empirical and theoretical/ epistemological analysis of gaming to the exploration of new trends in teaching urban planning and smart city concepts. In this way, the paper offers readers a new methodology for analyzing gaming from the urban planning point of view, bridging skilled users (Komninos, 2002) and behavioral sciences. We believe that this constitutes the opportunity for creating a new learning culture: one for smart learners.

2. *A case study: Assassin's Creed series*

The *Assassin's Creed* series, whose historical locations are a major characteristic and point of the overarching plot (Aroni, 2019), is among the most popular examples that use space realism to engage users. In fact unexpected and wide-ranging literature (Bailey, 2015; Bowden, 2017; Casas, 2016; Dow, 2013; Esteban-Espinosa, 2020; Morales & Elisa, 2018; Seif El-Nasr, Al-Saati, Niedenthal, & Milam, 2008; Shaw, 2015; Szrajber, Guzek, & Jach, n.d.; van Nuenen, 2017; Webster, 2014; Westin & Hedlund, 2016) demonstrates a its importance in this discussion. Specifically, it shows how architecturally interesting this video game is, while at the same time arguing that the spatial realism emerging in this game focuses on the representation of collective memory rather than a real archaeological and historical reconstruction (Aroni, 2019; Dow, 2013; Westin & Hedlund, 2016). In other words, many argue that the goal of providing a possibility to walk around ancient street blocks and monuments, in order to add the verisimilitude (Aroni, 2019), although interesting, doesn't correspond to the exact urban tissue or geometric and detailed aspects of the city (Westin & Hedlund, 2016). It is in the details of each urban element that the similarity and reliability of this game as a learning tool could emerge.

The specific case study of *Assassin's Creed: Brotherhood* (ACB) marks a turning point in open-word videogames (Juul, 2011), since the freedom of movement is expanded and the Renaissance Rome representation reaches a high level of detail. Even if the historical scenario isn't reproduced in an exact philological representation (Dow, 2013), the gamer can stroll around in the virtual city and explore the narrative of the game's scheme. This determines a gaming condition for users closer to travel than to that of an arcade gamer. The power of simulation (Foreman, 2004) of ACB is strong enough to allow users to emerge in the Renaissance atmosphere, walking through a variety of urban systems that include streets, piazzas, and monuments.

To study this further, this paper begins by defining which criteria and contents of the video game can be useful for learning architecture and its subdivisions. It then goes on to explain how the morphological and typological features of the projected world are used in the virtual world of a video game. Third, it argues whether the virtual world of the videogame is an appropriate tool for teaching and learning about architecture. The methodology depends upon an analysis of ancient Rome and its projection in the virtual world of *Assassin's Creed*.

3. *Methodology*

This research has been organized into three phases: First, we provide a theoretical framework for the concept of learning through gaming, constructing their argument through a conspicuous body of literature. This argument is developed in the next four sections and reveals two outcomes: why gaming is an innovative

means for studying and teaching architecture, and how this connects with the digital revolution and the smart city theory.

We then proceed to construct an urban morphological analysis of the architectural setting of the case study, based on criteria decided *a priori* and related to scientific literature. The overarching goal here is to reveal which are the characteristics of this new learning process that lead to a disembodied experience of the city, and then proceed to define it.

To do so, we compare the morphology of 15th-century Rome with the virtual replica available on the videogame. To enrich this work, we make a temporal compression study ethat evolves over three steps. In this process, we begin by establishing a set of certain points (monuments) shown on both real and virtual maps of Rome. We then proceed to calculate the walking distance time between these points in both cases. Finally, we point out the differences and establish the proportionality between real and virtual travel time.

Through this step, we suggest an innovative methodology to study the augmented space of the digital city in relation to the real city, illuminating the impact of the game to user's perception and participants' observations.

Consequently, this part of the research, which extends across two sections, establishes an urban vocabulary, which both provides a way to study the city when using gaming and defines the urban elements that consist of the new gameful - city environment.

In the end, the two methods of studying gameful environments bring about a number of issues for discussion. Specifically, extending the bibliography on the skilled users (Komninos, 2002), on the disembodied experience of the physical space of the game and of the consequences of the new learning method, we define the elements that describe the nature of a new entity: the "smart learner."

Based on this approach, we extend the discussion to frame how "smart learners" bridge the key factors that affect city planning and urban design.

4. *Gaming as a potential learning tool and innovation vehicle for the city*

4.1 Learning by gaming

The use of gaming in the educational context and for the purposes of learning and brain development is by no means a new phenomenon (Plass, Homer, & Kinzer, 2016). In fact, since the beginning of the 21st century, a vast amount of research has revealed that games have a unique potential in teaching and learning that is unlike any other medium (Squire, 2011). Similarly, Hwang & Wu, (2012) present a scientific background related to the implications of games in many disciplines. These include mathematics (Van Eck & Dempsey, 2002), software engineering (Cagiltay, 2007; Connolly, Stansfield, & Hainey, 2007), civil engineering (Ebner & Holzinger, 2007), business (Kiili, 2007), computer science (Papastergiou, 2009), geography (Tüzün, Yılmaz-Soylu, Karakuş, İnal, & Kızılkaya, 2009), language (Liu & Chu, 2010) and decision- science (Chang, Peng, & Chao, 2010). Kirriemuir (2002) goes on to argue for the relevance and relation of video games to digital libraries and digital learning technologies as they appear in global bibliographies. This means that computers are changing the way we learn, particularly with the contribution of video games (Shaffer, Squire, Halverson, & Gee, 2005).

These methods of learning might also reveal the acceptance of these tools inside educational contexts. The sense of presence that the virtual environments offer, numerous simulators, and the collaborative activities of the game are few of the reasons these tools more easily accepted (Russell & Laffey, 2015). Learners immerse themselves in the virtual environments, transforming into avatars that actively experience the process of learning (Walker, 1990). While users acquire new knowledge based on the simulations, rules, and consequences of the playing environment (Russell & Laffey, 2015, p. 111), at the same time, these environments offer the opportunity to learn new skills and interact with other learners. The critical point is that while gaming, users acquire knowledge about the simulated environment and they use it through the decisions of their avatars, which are related to the way they communicate with the other players and how they interact with their the virtual environment, as well as the way to deal with it (Russell & Laffey, 2015). This means that the learning experience augments not only technical and other skills related to the virtual

reconstructed environment, but also empirical knowledge that one would normally acquire only through actual experience. The specific experience, being disembodied, subjects the learners to a completely new perspective of the learning material, one based on observation, simulations, small tasks, and communication.

4.2 Gaming in the Architecture and urban planning disciplines

In architectural academic environments, the process of integrating gaming into teaching seems to be facilitated by the existing familiarity of architects with computational design. This makes it reasonable to propose video games as a tool for divulging information about architecture and to encourage critical interpretations of it (Rodríguez Alvarado & Hernández Belmonte, 2018). In fact, several leading world educational institutions (University College of London among others) integrated video games into their teaching methods (Vivancos, Ferrer, & López, 2017). However, in developing countries, games are not considered yet a useful tool. In Ecuador, for example, more than 50% of professors don't relate gaming to its positive implications (Ponce Lara, 2017) in teaching.

In the architectural environment that supports gaming as a teaching tool, many studies show that the design process of gameful environments is a compromise between the design of the subject matter and the desire to prioritize game play, meaning a compromise between the real world and the virtual scenario (Plass et al., 2016). Specifically, the visual aesthetic design includes visual elements, such as the overall look and a number of distinct explanatory characteristics, such as narrative context, rules, goals, rewards, multisensory cues, and interactivity which seem necessary to stimulate desired learning outcomes (Dondlinger, 2007; Plass et al., 2016).

However, despite extensive scientific literature and the major role of architecture in developing video games and everything related to virtual reality (Chan, 1997), it is difficult to identify a specific architectural methodology to design a video game that overcomes the historicist, pedagogical, and ICT approaches. In fact, gaming could be especially useful, as it could offer to learners a more complete space experience that extends beyond the learners' imagination to meet the actual reality of a place. Lastly, this process could have fruitful implications in relation to the urban planning discipline, as it allows for more varied city actors to collaborate, generating results that are very different from those obtained in a traditional setting. In fact, from an entertainment point of view, games can attract many users— and actors to share and exchange knowledge, data, innovative ideas, and solutions related to the narrative. In a physical setting, this activity could generate a dialogue about city issues, involving citizens in the creation and suggestion of ideas about the city, identifying preferred solutions and compromises. In the virtually reconstructed cities, learners have no active role in the city's reconstruction but rather in the overall success of the experience.

4.3 The experience of the place in gameful environments

From the point of view of the experience of the place, it appears that games use large data inputs coupled with technological outputs for better experiencing an area (Buhalis & Amaranggana, 2015). First, the design of spaces happens in a way that amplifies the needs of the narrative (Silva, 2020). This means that the virtual settings are developed in a way to convey specific messages. This means that a combination of techniques aims to transmit emotions, feelings, and sensations, and for this reason, colors, city noises, and materials are used under the perspective of attracting the user while conveying the message of the game. Secondly, since the goal of each setting is to pass the level, designers manipulate the circulation or add elements of intrigue through architecture. For example, designers would narrow down the roads width or add other worldly details that spark interest, inviting players towards a specific direction. In other words, the role of urban planning rules and methodologies is less evident, allowing more space for the cognitive theories of city development.

The use of gaming is also useful in the tourism sector, framing the paradigm of smart tourism (smart experience, smart business ecosystem and smart destination (Xu, Weber, & Buhalis, 2013). Smart tourism is linked to data analysis through collection, exchange, and processing of local information (Boes, Buhalis, & Inversini, 2016). It

is an interwoven system, so intervening in and working with one of the layers affect all three (Khan, Woo, Nam, & Chathoth, 2017). In this case, smart infrastructure forms the core of smart tourism, in which IoT, coupled with smart devices, can enhance a visitor's overall experience. Examples of this innovation involves location-based games which are so popular nowadays and take visitors on individual and interactive walks through the place being visited (Buhalis & Amaranggana, 2015). There, exciting scavenger hunts are possible anywhere and the local characters tell the history of the place and give background information. Location-based games bring history alive and create playful interactions between the visitor and the tourist destination.

Lastly, it seems that the city typologies designed with both positive and negative spaces, along with empty roads, are just as important as buildings, especially if the designer is trying to convey a mood of "mystery" or "ambiguity" (Stouhi, 2020), asking the players to feel a sense of uncertainty as to where they want to go next. As a result, they give equal importance to roads and the urban layout, and allow gamers to explore. Having said this, it seems as though in video games, the specific narrative message is the decisive element on the way to designing gameful environments If such environments are not conducive to perceiving the creator's narrative message, the user could lose interest in participating. In other words, the videogame players are the ones who have the power to accept or reject the game, which has an effect that extends to the market in general.

4.4 Gaming and the construction of digital innovation

The desire to combine entertainment and learning has been nascent since the dawn of the video game era, beginning with the first possibilities of on-screen representation of images that allowed simultaneous interaction of players (Dondlinger, 2007). This tendency of creating video games based on user interaction brought about detailed and elaborated environments that allow users to begin immersing themselves in a disembodied city. For example, the first simulations of the game of chess allowed users to interact among themselves and measure their logic skills against a machine, experiencing different levels of difficulty. This has been facilitated by the development of "rendering," which allowed video game developers to increase detailing in the frames that compose the set of the game. *Versailles,* in 1996, was a milestone in this trend (Coffrey, 1997), since a team of historians and architects worked with graphics to virtually recreate King Louis the 16th's palace, allowing for both private and public cultural institutions to participate in this project. *Monkey Island* in the early '90s was one of the most developed "point and click" adventures. In this game, the user was immersed in a non-realistic set and, according to the plot; they were merely obliged to read long texts corresponding to the different characters. The designers of Lucas Art inserted a great deal of information about the age of the pirates in the form of an "Easter egg" ("Monkey Island Special Edition Collection," 2011, p. 59).

Despite these advancements, the learning experience was still passive, and players were not able to explore every part of the virtual scenario. Here, users were able to access different spaces only upon solving certain challenges in the virtual scenario. The same gaming philosophy was used in *Versailles*, but in a very detailed set that was recreated with thorough attention to detail for the atmospheres of Roi Soleil's court. Even though the evolution of computer graphics has allowed game developers to increase the realism of the set, allowing the gamer to have a sort of dynamic history class, the experience was still static from the point of view of the user's freedom of moving around. The point-and-click title allowed gamers to learn a lot of information about the cultural aspects of the late baroque era in France, but in *Assassin's Creed*, that the open world was truly accessible to the user. This opened up the possibility to move around and interact with the gameful environment, even without progressing, level-wise, through the game. Interacting as an explorer or a traveler allows the gamer to deeply immerse themselves in the atmosphere and enjoy the virtual set with few limitations.

In following with the above, it seems that the amount of freedom a user has, as well as the detail of the constructed ambient, influence the overall city experience. This means that in some cases, the virtual game could be considered cultural media, similar to a historical documentary, or an audio-visual source of information.

Tab. 1: Methodology for the analysis of virtual scenario

Methods applied	Elements Analyzed	Dimension Analyzed	Experience related
Urban Form	Street block Urban Boundaries Natural elements	Physical (Urban Scenario)	Provide a general awareness of the position of the user in the urban system
Temporal compression	Travel time Main monuments	Perceptive (time-experience)	Provide a compressed, but realistic time of walking through monuments/landmarks
Typological analysis	Main monuments Architectonic features	Physical (urban scenario)	Provide a realistic historical image of the built environment, and contribute to create a general perception of life between buildings.

Arguing on the importance of analyzing the emerging theory from a practical point of view, we now proceed to analyze the ACB physical environment. This approach is an effort to confirm that the way to study the city can be useful to building gameful constructed environments. We argue that the following methodology can be used in future virtual city analysis.

5. *The research project: establishing a methodology to analyze the virtual environment of ACB*

The realistic scenarios in the world of video games represent a key feature of the AS saga. In order to understand which opportunities of learning the case study provides, this paper examines how realistic the virtual city experience is, using a methodology that reproduces basic concepts of city form (Gauthier & Gilliland, 2006), urban fabric (Levy, 1999), and more generally, the urban morphology (Gauthier & Gilliland, 2006; Kropf, 2014; Levy, 1999; Lynch, 1960; Oliveira, 2016) (Table 1). Specifically, it is based on the study of Lynch (1960), which addresses how the city might be read and interpreted through a set of physical criteria, such as paths, landmarks, edges, nodes, and districts, through which the user/citizen discovers the city.

As a second step, we analyzed the urban form, looking at (i) the urban tissue; in other words, the aggregate formed by complex system of street blocks (or simple tissue for Caniggia and Maffei (1981), and plan unit for Conzen (Conzen, 1960), i.e. "the unique combination of buildings, plots and streets" (Kropf, 2014, p. 50). Secondly, (ii) we looked at urban boundaries, limits that divide two areas with different social and spatial features (Lynch, 1960; Zoido Naranjo, de la Vega, Morales, Mas, & Lois, 2000). The last area analyzed is (iii) the natural physical form (Kropf, 2014), which covers natural elements inside the urban tissue.

This entire endeavour helped us to define the spatial representation of the virtual city. These elements depict the physical virtual scenario and provide initial feedback regarding the reliability of how precise the city form is in relation to the real one.

As a third step, we examined the experience at the ground level, calculating the walking time between a set of points/monuments selected using the same criteria of the ancient mirabilia (Accame & Dell'Oro, 2004; Kinney, 1990), i.e. the most popular and attractive sites. To do this, a temporal compression study among sixteen monuments revealed the relationship between the real-life walking time and that applied within the virtual city. Because of the ancient context of the video game, only walking time has been calculated.

Lastly, the authors controlled the similarity of landmarks in terms of the difference between reality and in the game. The reliability was also tested through a comparative analysis between the virtual monuments in the video game's database and the actual artefacts. Specifically, sixty nine important landmarks were detected in AC's virtual Rome. As a result, four filters have been applied to identify the monuments that present the most favourable characteristics to complete a reliable study and provide solid results. The filtering process was organized into four criteria, namely (i) the construction period, (ii) the documentation, (iii) the area and the infrastructure, and (iv) the transformation, which are described below.

Once the monuments were established, five parameters of typological analysis are defined. These are, first, the style, which is a sum of architectural features belonging to a specific historic period. This first point includes analysis of the facade, considered the most available and analysable part of the monuments in *Assassin's Creed: Brotherhood*. This is used to compare the macro features, which include the silhouette. This parameter also analyses the proportions, which is the relationship of measures between a part and the whole. In the next step, the construction materials define both the construction period and the architectural style. Finally, we selected some significant parts of the artefacts to specifically describe the architecture of the time.

The information about every monument is analysed, processed, and classified using a quantitative method. The data collection for each criterion has been organized by assigning the values of either 0, 0.5 and 1, „ representing null, partial and total compatibility. This means that the sum of three criteria varies between 0, representing a lack of compatibility, and 3, demonstrating total similarity. Finally, the percentage of similarity of each monument is calculated.

6. *ACB and the virtual urban form: how the analytical (or morphological) approach reveals learning opportunities*

The study of the urban form revealed a number of interesting similarities and differences between the gameful constructed environment and the real city. The overall physical - real boundaries of the Aurelian walls remain in both cases, even if the virtual ones seem to be descripted by more simplified graphics, without focusing on the representative complexity (Fig.1). However, once we are inside of the city walls, the morphology of neighborhoods according to the virtual map is considerably different from the real-life map..

For example, in the Parione neighbourhood (Fig. 2.), the virtual urban tissue of the reconstructed virtual environment represents a fragmented system of buildings. This means that all the urban development happens by positioning the building as the most important urban element, without making reference to the block, the street, the street pattern, etc., which usually represent the original form of the real

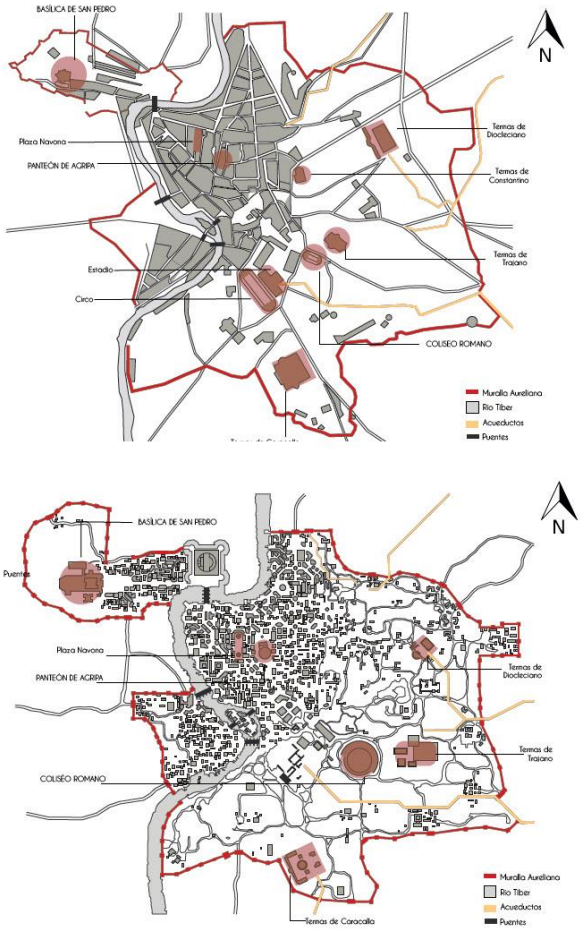

Fig.1: Urban boundaries and monuments. Top map represents real Rome, and the lower one is taken from the video game. Maps prepared by the authors.

city. As Bevilacqua describes (2018), the image of ancient Rome provides more urban elements, such as the Tridente system conformed by Piazza del Popolo, Via di Ripetta, Via del Corso and Via del Babuino (Fig. 3). In any case, the location of each element and its image remains more or less similar.

To study the representation of the natural environment, in both cases, we observed that the virtual morphology and position of the Tiber River has been designed with a good approximation to the real one; its width and flow rate, studied considering the temporal distance and the absence of modern technologies, revealed only minor transformations. Similar observations were made upon studying Tiberina Island, which seems to be very accurate and precise within the gameful environment.

The temporal compression analysis (Fig.4) reveals the following two variations: walking time

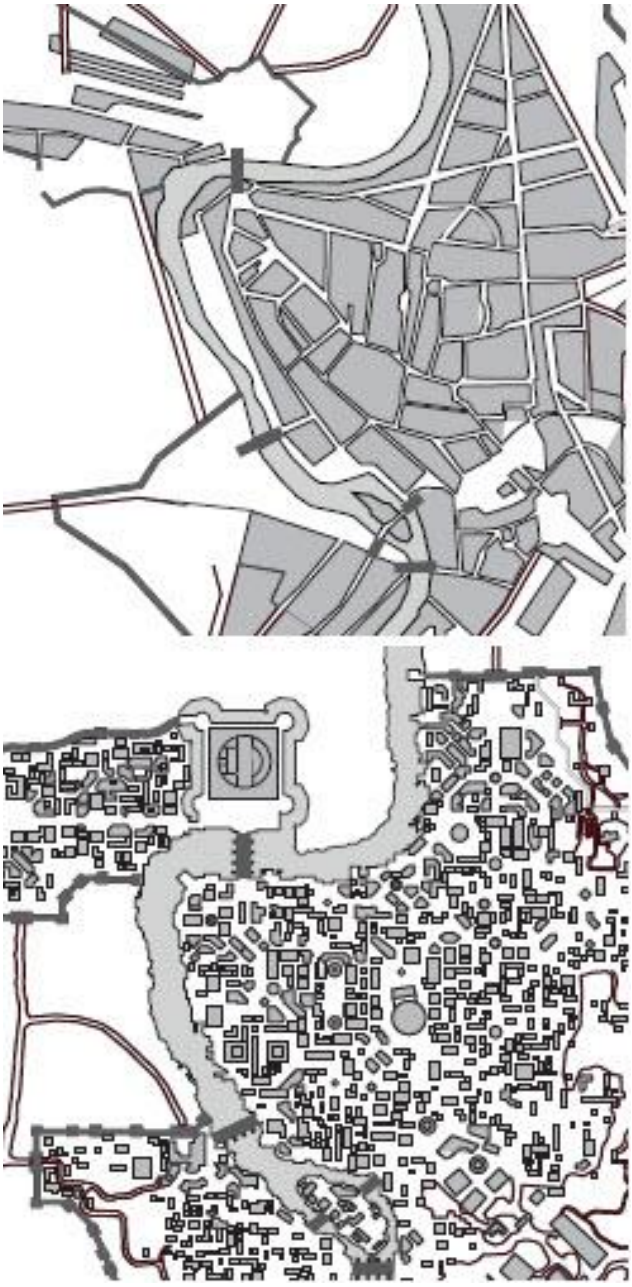

Fig.2: Virtual Urban Tissue VS Real Urban Tissue. In the simplified image of Peruzzi's map of Rome (left), the Tridente tissue is already presented, while in the virtual map (right) it does not appear. Maps prepared by the authors.

as influenced by the walker's desire in reality is diminished 10 times in the game. Specifically, the walking distance varies between two different points from 1:20 to 1:10, with a final average of 1:14 for all users. As mentioned above (chapter 3), this variation has been implemented to benefit the narration of the game, and as a result, alters the experience of real space.

Fig 3: Ancient map of Rome, 156- 65 Sallustio Peruzzi. (Bevilacqua, 2012)

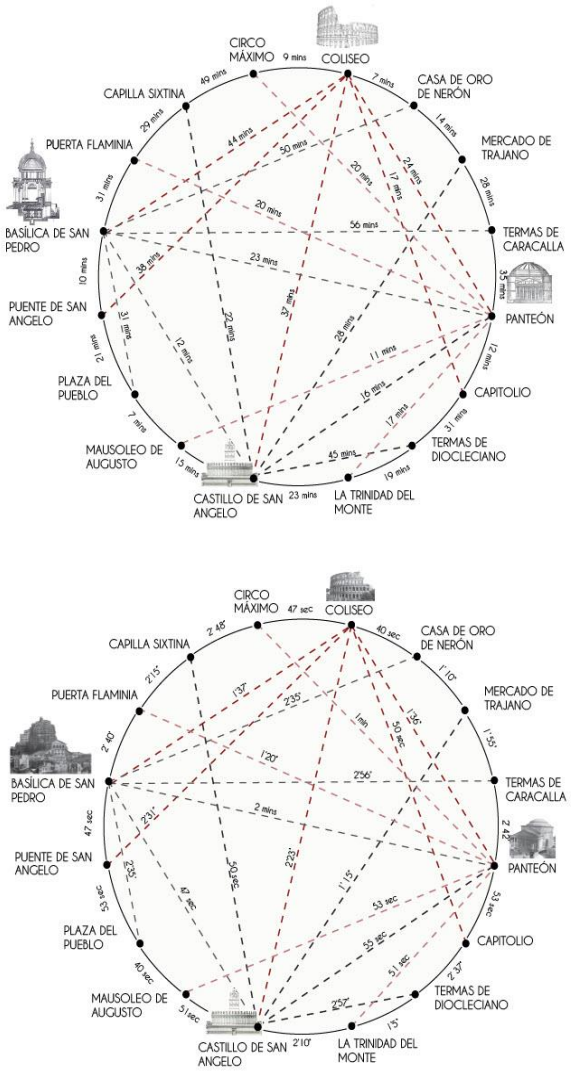

Fig.4: The top diagram is the real walking time, and the second is the compressed time of the video game. Prepared by the authors.

Lastly, the typological analysis of urban artifacts revealed the reliability rates for a selection of 20 monuments. Specifically, we observed that the Traiano Market had 83% similarity as whole to the real one, while the

Fabrizio Bridge had 17% (Fig. 3). In general, the research demonstrates that monuments reach a 57% of average similarity. Specifically, the most reliable criterion is for materials, which reaches 90% reliability, whereas the least reliable is related to proportions, with only 30% similarity.

7. *Conclusions*

We have made a contribution to the field by analyzing the novel case of ACB from the complementary visions of urban planning, smart learner and digital media. The new spaces created in the virtual replica bring a different experience of the city that could have educational implications, and also implications forsuch as the new skills required in this fastly changing world.

Working with the virtual replica of the city and building the temporal compression study in the reconstructed environment allowed us to merge digital and empirical methodologies of urban analysis and offer a new field for urban planning research On the one hand, gamification produces a higher level of engagement, collaboration, and better learning results that include new knowledge and skills. However, its role in architecture and urban planning would require further research and implementation activities. This is because, although many software and planning-based games already exist, there is a lack of scientific production regarding the full experience of knowledge about architecture and city. In any case, experiments in the field show that the multidimensional design of the digital space broadens the possibility of exploring the physical context and learning from realistic spaces. The urban space of the game is full of meanings, referencing the past, while mixed with the technology of the present. The paths and narratives revive the city, but more than that, they offer a new way of looking at it: a gameful adventure. In this way, they create a hybrid space, worthwhile not only for the users, but for any person immersed in this reality. Our findings suggest that the gaming approach opens opportunities for city learning, revealing how gaming augments the quantity and quality of architectural information that each user might acquire.

Furthermore, from an instructional point of view, the research revealed a number of suggestions on how to study and teach using gaming as an educational tool. These include: a) the form of the city through its geographical characteristics; b) the main actors - buildings that construct the imaginary of the city, which might include all city attractions and landmarks so as to recreate the memory of the specific location; and c) a study on the way time is expressed in the hypothetical scenario of a wanderer, meaning the actual walking time through the virtual city (Table 2.). This superposition allows for a deeper understanding of the virtual city at the ground level.

Both literature review and the case study suggest a new form of city experience that involves virtual scenarios, ICT, and perception of a realistic context. It is defined as a realistic (but not real) experience of a place where not all human senses are enabled but, as mentioned earlier, it transmits emotions, feelings and sensations and for this reason, colors, city noises, and materials are used under the perspective of attracting the user. This process brings about human interactions, invites people to join, offers a joyful experience and, at minimum, builds memories and meanings. New immersive realities emerge, where people wander and where the subject and the city interact. Lastly, as virtual settings are developed in a way to convey specific messages, in gaming, the latent message characterizes the nature of the experience. The authors suggest that this message is the educational outcome that the participants are expected to reach. This entire interwoven system of emotions, elements, actions, images, memories, meanings, interactions, and latent messages form what the authors suggest as a disembodied experience of the city to the users.

Is the traditional learner adequately prepared to make a full immersion into the disembodied city experience? While the study revealed the effectiveness of gaming in reaching more users, it also revealed the need for new skills that users need to acquire to best use this virtual learning scenario. Gaming inherently requires more technical skills and as a result, invites users to enrich their educational agenda. Specifically, it seems that learning through gaming means adding transversal learning approaches that combine interdisciplinarity with tech skills and the ability for digital interaction. Furthermore, the overall learning process changes: while in the traditional setting the learning outcome is based on the collection of information, here, users collect more information and skills to acquire a

better experience of the place. In summary, we argue that through gaming, a new type of learner is generated, with enhanced tasks but also skills that are at once flexible and progressive, in a time in which adaptability has become a key value of resistance against the contemporary consequences of COVID-19. Considering the technological nature of the study, the authors reflect on this smart learner, as well as on the possible implications of this new concept, not only for academia but also within society. As a result, gaming in a virtual environment acts to serve the community of smart learners in a way that increases their assets and attributes, building capacities that gain access, partners, networks and/or a voice. Such activities allow people to gain a lot of control per se and to become empowered (Labonté & Laverack, 2008).

Tab. 2: Implication of methodological dimensions in virtual and real experience

Methods	What the method help to perceive (experience)	What the method could teach in real life (learning)
Urban Form	Provide a general awareness of the position of the user in the urban system	Position of best landmarks in the city; User/landmark positioning and orientation Reading and understanding maps
Temporal compression	Provide a compressed, but realistic time of walking through monuments/landmarks	Organize city tours; calculate displacements; Reading and understanding urban design
Typological analysis	Provide a realistic historical image of the built environment, and contribute to create a general perception of life between buildings.	Improve abilities to recognize architectural, historical and archeological features of the monuments and their building environment.

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