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# Environmental Education in Action: The Case Study of WWF “School Program” in Greece

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# Innovation in Environmental Education: ICT and intergenerational learning

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*Proceedings  
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Innovation in Environmental Education:  
ICT and intergenerational learning  
International conference proceedings

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# RE-THINKING THE ENVIRONMENT THROUGH GAMES. DESIGNING LOCATION BASED MOBILE GAMES IN HIGHER EDUCATION FOR ENVIRONMENTAL AWARENESS

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## Abstract

The scientific aim of this contribution is to explore the topic of Location Based Mobile Game (LBMG) design in higher education as a way to raise environmental awareness, giving further research a push. The cross-national cooperation of Germany and Italy pays respect to the international occurrences of urban and hybrid games and their large applicability in the field of social innovation. This paper shows the design process on the ground of two workshops operated on a binational basis, presenting an overview of the tools used to design games, and some of the results collected. Its primary contributions consist in (1) an analysis of the game design process as a learning experience, and in (2) the assessment of the LBMGs designed, answering to a current need of experience assessment and comprehension, both from game design and research perspectives.

**Keywords:** location based mobile games, urban gaming, meaningful play, higher education, environmental learning, hybrid space.

## Introduction

LBMGs offer the possibility to navigate in hybrid spaces bridging digital and physical spheres through communication and mobility (de Souza e Silva, 2006). They are engaging activities that give players the chance – as well as the reasons – to explore uncommon and original paths in their environment and to perceive well-known places in a different way initiated by the fictional layer and the game mechanics overlapping the everyday space (Montola et al., 2009). Additionally, they can versatiliely cover several issues, suggesting civic and social reflection.

The concept of *experience* is deeply linked to the Game Design practice. Taking part in a game, the player dives into a *fictional world* that has rules, conventions and characteristics that separate it from the real world and the everyday life. However, dealing with urban or hybrid games, the boundaries of the *magic circle* tend to blur and become a membrane (Zimmerman, 2012; Juul, 2008; Walther, 2005). Through their narrative and gameplay, such games interact with the surrounding, for example by retrieving historical situated meaning, recovering local traditions and culture, and/or empowering social as well as civic action (Flanagan, 2009; 2014; Bertolo and Mariani 2014). In particular, LBMGs endeavour to modify the environmental perception, to transfer knowledge, and also push players for reconsidering certain behavioural patterns (Ackermann, 2014). Like with environmental theater (Schechner, 1973), LBMGs demand players and spectators to acquire the awareness that a certain playground means and represents a setting different from the ordinary one (Frey, 1946), which exists only for a certain time period and follows self-referential rules – a space of *otherness* that is simultaneously neither here nor there, just like Foucault coins it in his concept of *heterotopias* (1967). This opens up a time slot of increased opportunities for environmental learning. The fact that LBMGs ask for physical movement in the space conceives the body as an interface (Sielke and Schäfer-Wünsche, 2007) and enlarges the learning processes from the cognitive to the corporeal sphere (Prades, 2013). In creating LBMGs designers not only shape such experiences for their players but they also come across them, as one part of the iterative process of design is the playtesting phase.

In the light of the reasoning so far, our research questions are:

RQ1: What kind of experience is generated when a LBMG suggests players to enter a fictional world and perform in a *space of ambiguity*, dealing with an issue of social/civic matter?

RQ2: Can the iteration of the design process activate learning processes, triggering reflections about the environment as well as about the importance of testing and experimenting?

## Methodology

We applied a multidisciplinary approach to enhance environmental awareness and appreciation, showing how LBMGs function as powerful, intercultural tools to be meaningfully integrated into higher education classes addressing different subject areas. Between 2014 and 2015 two workshops (WS) were held in Germany and Italy leading students to design hybrid-space experiences to share their own view of the communitarian context they live in. The aim was to suggest a change of perspectives telling stories from fresh points of view. The students worked with the free online editor ARIS, which gives an easy entrance into game design for mobile devices, as it does not require a prior knowledge in programming and allows to intuitively work with geolocation using google maps.

In Germany the design activities were integrated into a weekly course of the BA in Media Studies. 22 students designed LBMGs for the town Siegen in groups of up to four persons, realising 9 different games. The activities included intense location scouting, creation of narrative and rules, regularly plenary sessions to mutually update on the progress of the projects, and playtesting of the prototypes. The location scouting was meant to raise awareness for the spatial specialities of the environment, following the approach of *environmental theater* to “start with all the space there is and then decide what to use, what not to use, and how to use what you use” (Schechner, 1973, 25, emphasis in the original). The final games were curated and performed in the International Urban Games Festival playin’siegen. A qualitative enquiry conducted one year after the WS (n=13) scrutinised the persistence of meaningful (longtime) experiences related to the game design process and the alteration of the designers’ perception of their environment.

The Italian WS was an intense one-week course with 50 participants of the MSc in Communication Design. Students were told to design hybrid reality games specifically addressing social issues: social norms (n=4), re-appropriation of the space (n=4) and multiculturalism (n=1). They were asked to focus on the performance aspects of gaming and encourage interactions with passers-by enabling reflection processes not only in the players but also in non-playing people. The design process included cyclical periods of presentations and group reviews. To critically observe the playtest of their own games and to collect data for the research, designers were asked to do rapid ethnographies (n=52), while playtesters had to self-evaluate their game experience in the form of a questionnaire (n=62) we supplied.

The questionnaire was built to evaluate the play experience and its aspects, the feelings perceived, and the relevance/pleasantness of the interactions with the game elements. As a consequence, the results obtained gave the designers important insights into games’ playability and the way they met the initial aims and expectations. We drove students through an iterative process of design and playtest to enable designers to assume the potential transformative dynamics they expected to solicit in their players and also check their occurrence.

## Results

The data shows that during each WS the students created appealing games with interesting play experiences. As documented in the enquiry, the creation of appealing hybrid reality experience generated both a feeling of satisfaction and a strong bond between designers and their artefacts, facts supported by the large amount of pictures shared on Facebook and Instagram. The development of a fictional layer overlapping with the common environment led players to access a secret additional meaning of the space, shared only by those who participated in the games. This strengthened the bond between designers/players and their environment. Furthermore data from the German WS shows how the game design process affects students by altering their involvement with the surrounding, and by activating multiple learning processes: students were pushed for trying out new ways inside the city and by that discovering otherwise unknown sides of it.

Even a year after the German WS, students report that passing through some locations inside the city frequently reminds them of their own game or of the games they played. This is partially due to the fact that some existing places/parts of the city (e.g. fountains, shops) were transformed into game elements, and partially triggered by some of the games’ materials still present in the urban space (e.g. qr codes and markers). In short, designing a game for a specific urban environment led students to an intense cognitive



analysis of the environment followed by outlasting changes of its perception. This statement is pointed out in all the questionnaires we collected from the German students.

This reasoning partly answers to RQ2 since the design process and the play experience altered designers' attitude towards their environment: the tendency to recognise game elements in the real space confirms the existence/persistence of the space of ambiguity LBMGs created. The game elements call to mind past experiences and jog students' memories about the fictional world they experienced.

Other than in Siegen, the investigation in Milan specifically took into account players' perspective, evaluating game aspects, enjoyment and feelings perceived. The questionnaires prove that 79.9% of the players enjoyed the games "pretty much" or "a lot", while 18.8% "quite enough". Considering all games the aspects players liked the most were: (1) completing tasks 58.6%, (2) being part of a group 57.1%, and (3) being immersed into the story 51.4%. For each game, Fig. 1 presents the details of the most enjoyed aspects, defining a spread interest on common aspects such as completing tasks, but also some peculiar responses on specific items, as the fact of running into new situations within habitual spaces. The figure shows how the two items connected to the definition of the fictional world (story and character) raise together the highest interest into players, attesting their importance for the overall experience. We believe that the fact of physically taking part to a narrative, concretely experiencing its ludic fictional world and sharing it with others (group item) defines a very effective way to move players to reconsider some points of view they use to take for granted.



Figure 1. Aspects of the game players enjoyed the most. All values are in percentage.

Questioned about the feelings they experienced during the playtests, players were allowed to measure 15 different items on an interval scale from 0 to 3 (see Fig. 2).

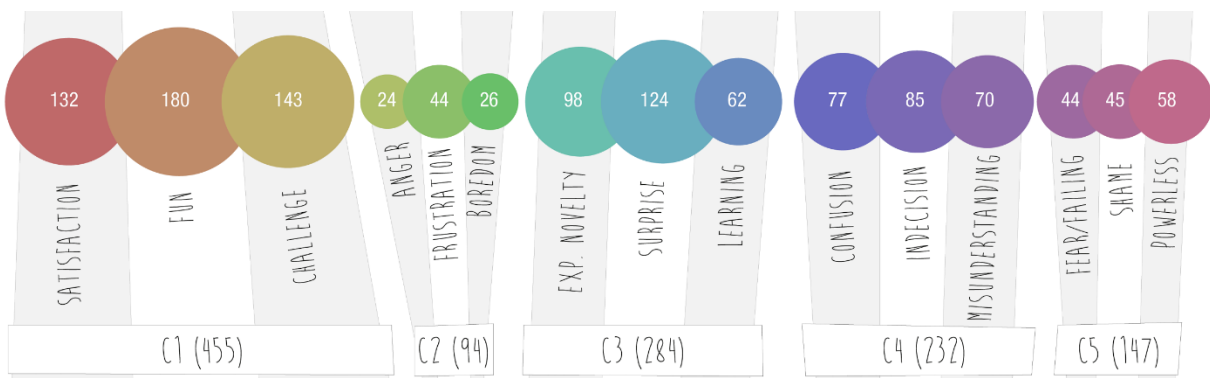


Figure 2. Feelings players perceived during the game experience.

By classifying the single items into broader categories it becomes clear that the interactive experiences functioned really well in the level of game enjoyment (see the difference between C1 and C2). The presence of C2 values is noteworthy: anger and frustration could be indeed feelings the designers intended to elicit; on the contrary, the presence of boredom usually identifies the need to modify some parts of the game. The origin of the feeling of “boredom” should be tracked in the corresponding ethnography that the game designers did. By intertwining data and observation, it is possible to consciously intervene on the game and apply the required changes. Answering to RQ2, the awareness that comes from this data intersection activates a learning process on the design process itself, highlighting the importance of the playtest as a design process phase. In addition, the high load of C3 which tends towards the experience of new situations connected to a familiar environment (built from learning, experiencing novelty, surprise) is quite striking and heavily supports RQ2. Also the quite high load of C4 and C5 – which both aggregate feelings of insecurity even if in different ways – can be explained on the one hand by the combination of digital and physical spaces that leads for instance to insecurity according to the orientation, and on the other by the *occupation/invasion* of serious spaces wherein players had to perform and behave in playful and bold ways. Dealing with both kinds of insecurities, while being and navigating in a certain familiar environment initiates reflection processes on multiple levels.

As a pattern, the fact of wearing masks or identifiable objects seemed to have helped creating a sense of belonging to a group, and of clearly taking part to a performance (Fig. 3). It also contributes to make tangible the presence of a protective frame and the message “this is a game” (Bateson, 1972).

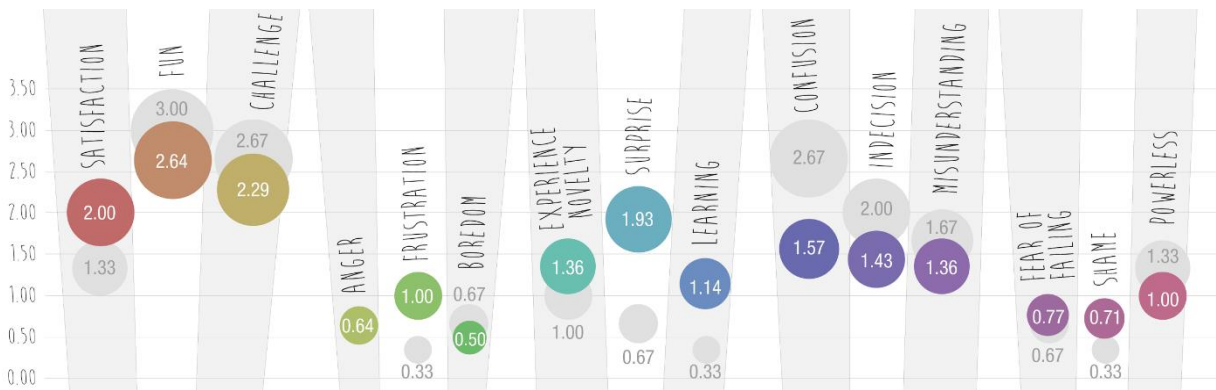


Figure 3. Considering the importance of the fictional world, the figure shows a comparison between feelings players experienced and the fact that players were wearing masks or other identity objects (coloured spheres) or not (grey spheres). The values are the average of the values gathered.

Another crucial feature supported by the data collected is the immersion into the fictional world and its story. Analysing the players who stated to have particularly appreciated the story of the game they played (rating the item with 2 or 3 out of 3) we found an interesting intersection with some of the feelings perceived: high levels of fun, good levels of satisfaction and low levels of shame, even if most of the games designed required embarrassing performances in crowded places and interactions with strangers. Good stories and coherent fictional worlds helped players to awkwardly perform in the space without feeling ashamed. In addition, as shown in Fig. 4, the games whose stories were measured with high scores (2 or 3 out of 3) were connected to a stronger feeling of learning (44.4%) – compared to the overall average (31.4%).

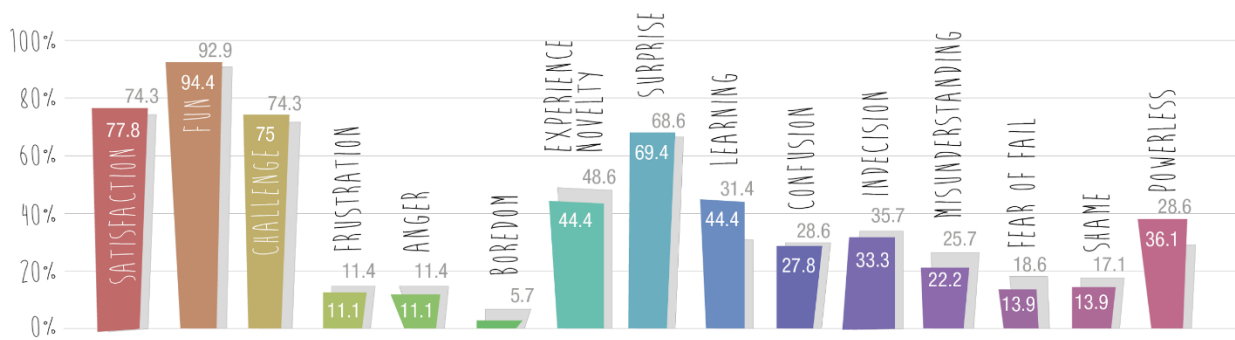


Figure 4. Focus on players who said the story is one of the game aspect they enjoyed the most, intertwined with the feelings they perceived during the game experience. All values are in percentage.

## Discussion and conclusions

The explorative study clearly outlines the potentials of applying LBMG design in higher education to raise environmental awareness. The research on the two WSs and their outcomes shows how connecting games to certain spaces initiates multiple cognitive and corporeal analysis with the surroundings, and creates long lasting memories that are inextricably linked with a specific environment. The increasing availability and user-friendliness of free game-editors enabling people to self-create LBMGs (like ARIS) without programming knowledge, allows to extend this kind of WS from media related studies to other fields of higher education. The creative process empowers designers to become an active part in shaping urban experiences reflecting how they want players to perceive a certain environment, its elements and meanings. In so doing, such tools provide a crucial step in yielding participation by action in a performative culture perspective (Volbers, 2014). Still research in the field is very rare.

Our contribution is to highlight the relevance of the topic, by giving insights into a first explorative study in order to give future research a push. As visible in the presented data, designing LBMGs produces various learning processes in the field of environmental awareness for both, the designers and the players. In particular, data showed how an appealing story and fictional world seem to increase the players' feeling of having learned something through playing. Creating an LBMG means to shape imaginary worlds out of scratches (Wolf, 2014). The surrounding as a real space coincides with the fictional space wherein players move, and the game world is communicated essentially through the game identity (written text and images). In these cases, it becomes fundamental to involve players into an activity that *makes sense* within its specific frames, and enhance their condition of immersion with masks and identity objects. Even if these objects look funny or ridiculous, they yield a safe embodiment in the fictional world, and give players the *power* to play other roles, wearing a real or symbolic mask that acts as a protective covering.

These observations highlight that those who play are largely influenced by the fact of wearing a mask and also by the sense of belonging it engenders. It results in a condition of openness that suggest players to become more inclined to acquire knowledge and learn in general, as well as to address sensitive and complex matters (Bertolo and Mariani 2014).

Furthermore, we focused on the knowledge students acquired during the WSs. The ethnographies they ran in the urban space allow students to understand the role of experience analysis in the design process; then they learnt about games' potentialities as systems of knowledge transfer. Both outcomes are founded on the questionnaires and the rapid ethnographies during the design process, functioning as tools to generate awareness on what it means to design experiences situated in the city, and test their effectiveness. Through the WS activities students understood the importance of observing the play experience to understand if the games they designed were performing as expected. Additionally, collecting information through the interdisciplinary tools we delivered (formats for questionnaires and rapid ethnographies) they could compare the resulting play experiences with their own expectations and as a consequence comprehend what improvements each game needs.

To conclude, we observed that LBMGs activate environmental awareness, as well as a process of knowledge transfer lead by experiences. Independently of the games' contents, data assumes that the initiated modification of the designers' perception of their environment triggered by (1) the intense analysis of their surrounding required for the design process and (2) specific reflections due to the fact of being situated in an active and inhabited environment go far beyond short-term effects. Unfortunately, research

in this field is totally missing, yet. That is why the paper intends to encourage researchers from different fields of study to undertake especially longtime studies in the domain. As documented, workshops on LBMG design not only function as a good basis for further analysis and research but also activate interesting learning processes in the students comprehending the role and the importance of the observation activity in the iterative process of design.

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