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FUN BY DESIGN:
THE GAME DESIGN ACTIVITY AND ITS ITERATIVE PROCESS AS (PLAYFUL) LEARNING PRACTICES

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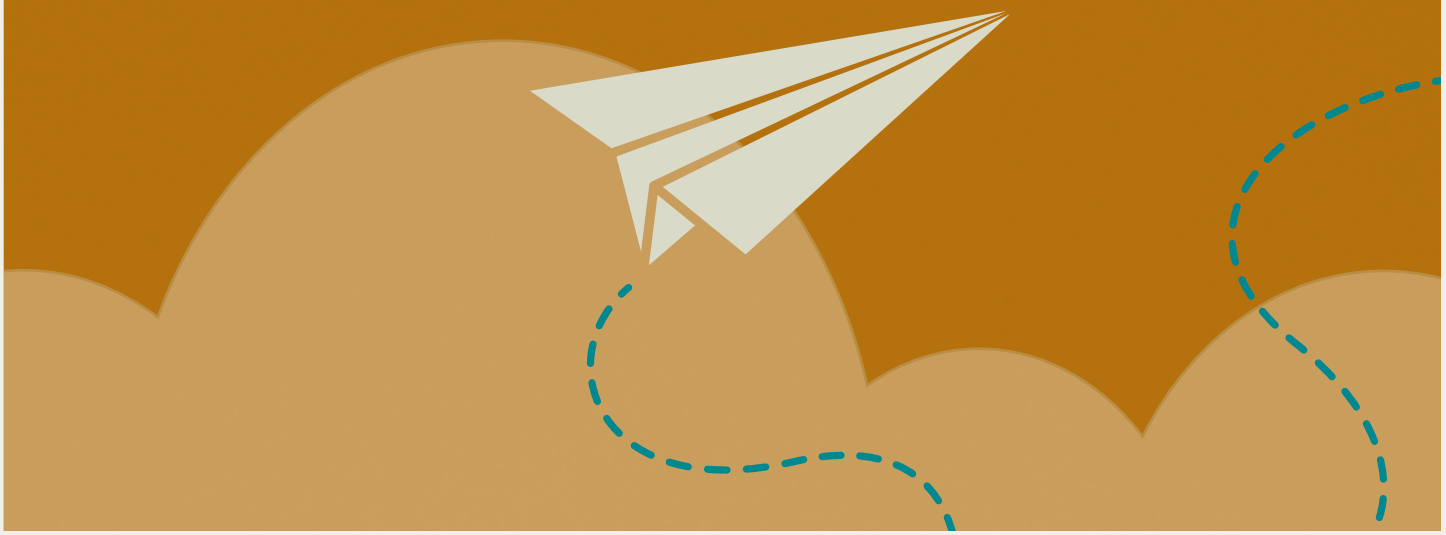
LOCATION BASED MOBILE GAMES, GAME DESIGN ITERATIVE PROCESS, PLAYFUL LEARNING, HIGHER EDUCATION, RAPID ETHNOGRAPHY, QUESTIONNAIRE

ABSTRACT

THIS CONTRIBUTION PROPOSES A CRITICAL REVIEW OF THE RESULTS OF A WORKSHOP HELD AT POLITECNICO DI MILANO PROBLEMATISING HOW PLAYFULNESS AND 'FUN BY DESIGN' AFFECT GAME DESIGN ACTIVITIES AND CONTRIBUTE TO GIVING STUDENTS A DIFFERENT AWARENESS OF THE PLAY EXPERIENCE. THE PRESENTED ACTIVITIES ARE PART OF THE AUTHORS' JOINT RESEARCH IN THE DOMAIN OF SITUATED GAMING AS A FORM OF PLAYFUL LEARNING IN HIGHER EDUCATION, WHICH INVESTIGATES THE PART OF BOTH THE DESIGNERS AND THE PLAYERS (ACKERMANN & MARIANI, 2015). THE ANALYSIS INVESTIGATES HOW THE ITERATIVE DESIGN PROCESS SIMULTANEOUSLY ELICITS FUN AND ACTIVATES REFLECTIONS ON THE GAME DESIGN PRACTICE AND THE PLAYTESTING ACTIVITY AS A NODAL MOMENT FOR PLAYERS AND DESIGNERS, WHERE SERIOUSNESS AND PLAYFULNESS INTERSECT.

ALLOWING AND REQUIRING PLAYFUL PARTICIPATION ON MULTIPLE LEVELS, AND AIMING TO EMPHASISE THE PLAYERS' PERSPECTIVES, WE ASKED 45 STUDENTS TO (1) DESIGN LOCATION BASED MOBILE GAMES, (2) PERFORM THE OBSERVATION/ VERIFICATION PROCESS AND (3) EXPLORE ITS ELUSIVE AND CHALLENGING PHASES. DATA WAS COLLECTED FROM RAPID ETHNOGRAPHIES AND QUESTIONNAIRES COMPILED IN THE PROCESS.

THE CONTRIBUTION EXPANDS THE REASONING FROM THE FUNDAMENTAL DISCOURSE OF MEANINGS EMBEDDED AND COMMUNICATED THROUGH GAMES, TO THE IMPORTANCE OF THE GAME DESIGN ACTIVITY AS A RECURSIVE PROCESS OF KNOWLEDGE ACQUISITION AND AS A SPECIFIC FORM OF PLAYFUL LEARNING.



Introduction

As Huizinga stated in his *Homo Ludens* (1938), the game has been part of human life since the beginning. It is a natural activity that predates the rise of society itself, and it is deeply involved in our everyday life: from the learning processes to the continuity and solidity of collective and institutional life (Goffman, 1961; Caillois, 1957), the game can influence every aspect of human culture and behaviour (Winnicott, 1971; Piaget, 1966; Bateson, 1972). For a long time adult play has been considered a childish or time-wasting activity (Fink, 1957). Today, however, this depreciating attitude has changed, acknowledging the multiplicity of values and benefits it entails. As research and development initiatives proliferate, playing games has become a practice to pay burgeoning attention to. In particular, the game's ability to create interactive immersive conditions featuring intense levels of motivation and entertainment contributes to making the play activity emerge progressively as a serious, involving and educational medium (Squire, 2006). To a similar extent, everyday life and practices are increasingly permeated by game and play elements, resulting for example in ideas like the 'ludification of culture' (Raessens, 2006, p. 53) and the 'playful turn' (Richardson, 2010, p. 445). As stated by Ackermann, Rauscher & Stein (2016, p. 12), '[t]he distinction between play and playfulness adds a deeper understanding to established terminologies'. Following Sicart (2014, p. 21), playfulness can be defined as 'a physical, psychological, and emotional attitude towards things, people, and situations'. By being conceived as a kind of attitude, playfulness is not identical to play, which describes an activity (Sicart, 2014, p. 22). Other than play itself, playfulness does not follow an end, but remains connected to the activity it is applied to: '[I]t's a different means to the same end' (Sicart, 2014, p. 26). Echoing the author, in that sense playfulness presents a creative form of appropriation allowing to fruitfully engage with serious contexts in a personal way. The associated intersections of the serious and the playful have given way to heightened activities by theoreticians and practitioners, who argue that games intentionally designed to embed values and meanings can affect players to the extent of influencing their knowledge, attitudes and/or behaviours. Consistent and interdisciplinary literature by scholars such as Jenkins (2009), Salen (2008), Flanagan (2009; & Nissenbaum, 2014), Gee (2004; 2005), Squire (2005; 2006; 2008), Bogost (2006; 2007; 2011) and Stokes (2005; et al., 2006; et al., 2014) establishes that games *can* successfully address problematic topics and hint at better/alternative ways of thinking and acting. Games can be viable resources to tackle specific contemporary issues. In different ways, through experimentation and research with different perspectives and objectives, each of the authors listed above argues that specifically designed games can generate experiences of play that are *able to* suggest a better understanding of the matters addressed. This articulated starting point that aims to sum up a varied and eclectic scenario serves to introduce the fact that nowadays the game has become a significant lens through which to look afresh at the world and its issues. In parallel, the game also emerges as a research tool to better understand and learn through the experience it suggests (Gee, 2007; 2010; Salen et al., 2011; Prensky, 2007).

In this perspective, the profession of the game designer becomes an important point in terms of participation, as they create situations to be lived through by others, able to generate meaningful experiences (Mariani, 2016).

Taking that into consideration, we expand the reasoning from the fundamental discourse of meanings embedded in and communicated through particular games, to the importance of the game design activity itself as an activity that necessarily interlinks seriousness and playfulness. This contribution analyses the activity of framing games as sources of experiential learning by applying the game design activity into higher education through a five-day workshop intended to raise awareness about what it means to design games through an iterative process. In particular, we draw attention to consciously applying the diverse phases of the process, highlighting the role of players, their contribution to the process and the possibility to playfully design.

We challenged our students to address actual socio-cultural, environmental or behavioural issues, asking them to free their poetic imagination and develop games that make use of the built environment for presenting perspectives, reductions or metaphors. The concept of the workshop was challenging since it was meant to decidedly bring together seriousness and playfulness in the field of playing and game design. We asked students to craft

games that put serious topics at play and simultaneously allow a condition of something we want to call having 'fun by design', referring to the condition of amusement and engagement experienced by accomplishing a creative and also functional activity like designing. We structured the activities of the week as an ongoing process of participative, playful acquisition of knowledge, based on hands-on experimentation, collective reviews, learning by doing and cycles of testing meant to both assess projects and train students, increasing their familiarity with the multiplicity of aspects and topics involved when a designer is asked to design a game.

We were particularly interested in observing if and how playfulness emerged during a workshop intended to transfer the crucial role of the test and analysis phases; two steps of the design process that, although well-known are often omitted by students. In point of facts, what is frequently underestimated – especially by beginners and students – is the importance of employing clear strategies with structured and comprehensive tools to conduct the test and the consequent analysis of the data gathered, namely observe the play experience and understand, for example, the effective ability of a game to answer the expectations of its designer(s). In view of what has been said so far, the questions we pose cover the game design activity and its iterative process in higher education as learning practices.

How far does the attitude of playfulness permeate the different phases of the game design iterative process? And how does the presence or absence of playfulness influence students' performance during the workshop and their awareness about the games they designed, as well as the importance of their mutual participation (and roles) during the design activity itself?

Method

To investigate the occurrence of playfulness during and its function for the iterative game design process, a five-day workshop on Location Based Mobile Games (LBMG) was held at Politecnico di Milano, School of Design, on 11-15 May 2015. Involving an MSc class of 45 students, the workshop explored the topic of situated and contextualised games as communication systems able to raise awareness on issues of social interest, involving students in the processes of (playful) design, test and analysis. This was to assure the aforementioned interlinkage of seriousness and playfulness. Students were grouped into nine working teams of four to six people, and they were offered the choice between three overall topics that they were to address through their game: multiculturalism, social norms and re-appropriation of space. They were told to use the ARIS editor to build their games, allowing easy connections between digital and physical elements (via GPS and QR codes). Apart from the accompanying technological restrictions, students were given absolute freedom in the creation of their game – to support the facilitation of playfulness.

The workshop program was structured around four determined *iterative moments* (fig. 1), enabling the students to experience different roles and their influence on the attitude of playfulness during the process. The iterative process of design was structured as a source of pragmatic *recursive learning*, based on failure, intended in its broad meaning, as a way to discover that expectations and initial beliefs can be incorrect and require review (Mariani, 2016). The game design process hereby entails the acquisition of new knowledge and insights based on the experience gathered through the enquiry, which required a certain attitude in order to glean data, understand the experience generated and balance the simultaneous objective of conveying information/meaning and entertaining players. This allowed us to address the questions of how the iterative process prompts students to reflect on the game design practice itself and the role of the playtest activity as a crucial moment that is as playful for players, and as crucial and still playful for the designers.

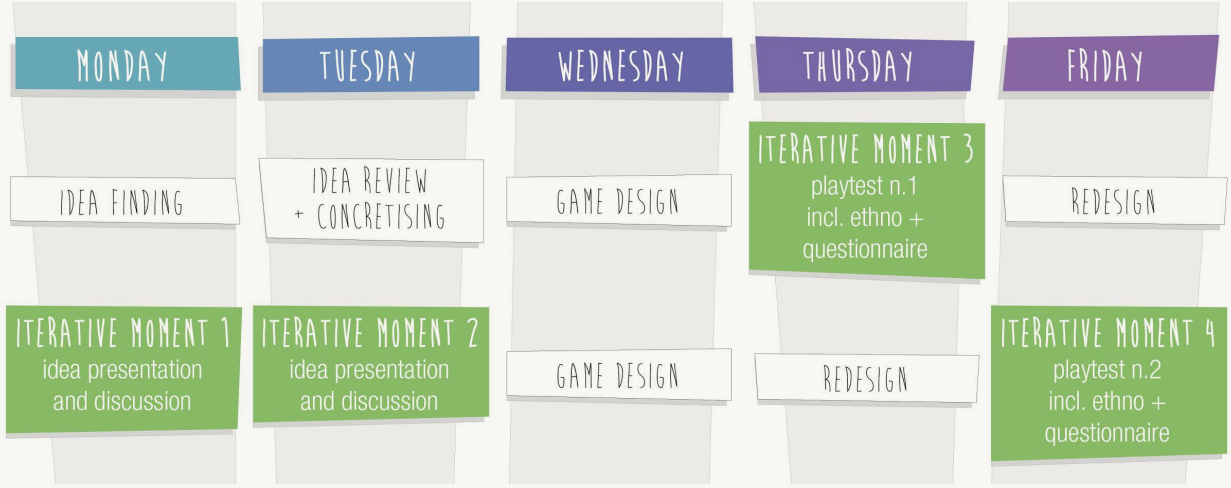


Figure 1. The workshop activities, in synthesis.

Since the 'idea finding' phase, students started to see the importance of mutual cooperation between groups to prompt and facilitate the development of the original concept. Students indeed identified the topics that were relevant to address (like problems to handle or a need to deal with). Then each group defined a concept aimed at covering the problem, drafting the general idea on a poster for sharing it with the class. Such a process encouraged groups to mutually interact and enter into a collective dialogue that produced a plurality of observations, perspectives and stimuli, which worked towards improving the initial concepts. The posters presented as part of iterative moments 1 and 2 impressively showed huge variation in the approaches chosen by the groups, pointing towards a general presence of playfulness, also in terms of topic appropriation.

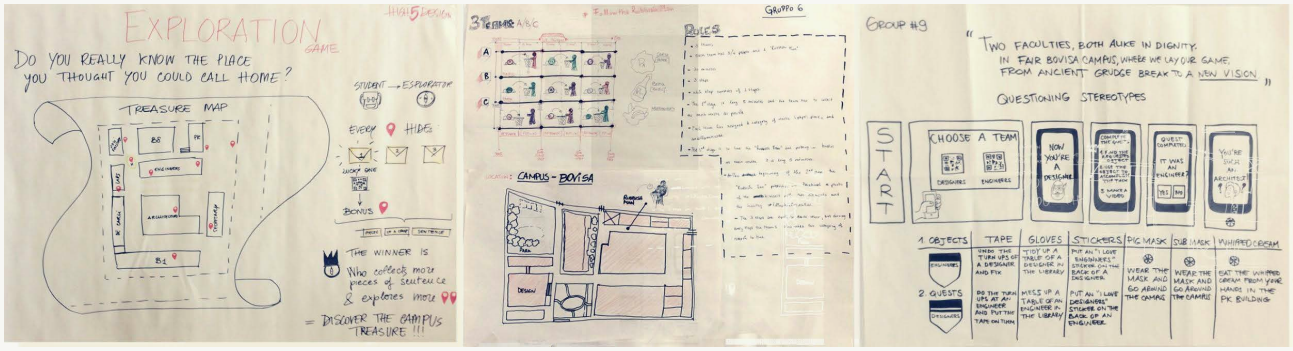


Figure 2. In the 'idea finding' phase, students identified the topics to address and presented their concepts to the class.

During the five-day workshop, students put a lot of effort into designing the game concepts and elements: they accurately planned the game mechanics, they elaborated and established the dynamics, they meticulously shaped the aesthetics – recalling the structure of the MDA framework, short for Mechanics, Dynamics, and Aesthetics (Hunicke, LeBlanc & Zubek, 2004), here applied in a design perspective rather than as a tool to analyse games – to answer the game's communicative aim. Nevertheless, the more they dived into the actual design process, the more they entered a mode of absolute focus and left behind the attitude of playfulness. This was visible also in their tendency to totally underestimate the importance of the two fundamental steps that follow the initial design phase: the (play)test and the analysis of its results.

To rehearse the playtest's primary function, we recall Fullerton:

> *Playtesting is the single most important activity a designer engages in, and ironically, it is often the one designers understand the least about. The common misconception is that playtesting is simple-just play the game and gather feedback. In reality, playing the game is only one part of a process that involves selection, recruiting, preparation, controls, and analysis.*
> *(Fullerton, 2014, p. 271)*

In that sense we can identify the playtest as a key exponent of the concept of fun by design and a way to playfully participate within the design activity. In letting students try out their colleagues' prototypes instead of their own games, they were able to experience the games in their regular mode of being an end in itself, which was meant to facilitate playful behaviour. Since the data collected concerned someone else's game, the outcomes of the playtest activity were not relevant for the actual players, who had the possibility to simply dive into playfulness, experience the game and explore its topic. The workshop as a whole did not focus on competitive approaches, but rather on cooperation, to facilitate and encourage creativity in the appropriation of the game design process. Students-as-players participated and affected the design process within the iterative process of design in which the (play)test was situated, revealing which problems they bumped into during their experience and proposing solutions in a *designerly* way. Inputs to improve the game came from cognitive or experiential dissonance experienced by the students' play activity. The playtest phase thus emerges as a space and time of dialogic and experiential learning triggered by taking part in playful activities and being aware of covering an important function in the process as a whole. Students-as-players and the systematic inclusion of their feedback are part of a practice that is grounded on catching and framing the experience that the game was supposed to elicit and constructing a fertile dialogue with designers to provide feedback. In so doing, students-as-designers collect data as well as evidence to develop awareness and re-design accordingly. The remarks by the testers were not decisive for the final evaluation of the games, but they contributed to improving the experiences/artefacts. Other than the activity of playtesting run by students-as-players, the students-as-designers' activity of doing ethnographies was conceptualised as a focused rather than a playful activity. They were meant to observe their own games in action to get ideas for improvement. This was experienced as being decisive for their own projects. The mix of methods (and also roles) during the workshop allowed students to slide between opposing attitudes. The iterative game design process mostly depends on a close and *thick understanding* (Geertz, 1973) of how players engage with rules, setting, goals and core game mechanics. This is to a higher degree a matter of study because games in the urban space inevitably interact not just with the design system, but also with public spaces and consequently with people who are not playing, but who are, to a diverse extent, involved in the play activity. As a result, passers-by in particular participate in the games without being part of the game design process. Therefore, it is important to understand the way they interact with the game, with players and the interplay they activate, as elements to analyse and/or verify the effectiveness of the game, and consequently to improve it.

> *In iterative design, interaction with the designed system is used as a form of research for informing and evolving a project as successive versions or iterations of a design are implemented. Test; analyze; refine. And repeat. Because the experience of a viewer/user/player cannot ever be completely predicted, in an iterative process design decisions are based on the experience of the prototype in progress.*
> *(Zimmerman, 2003, p. 176)*

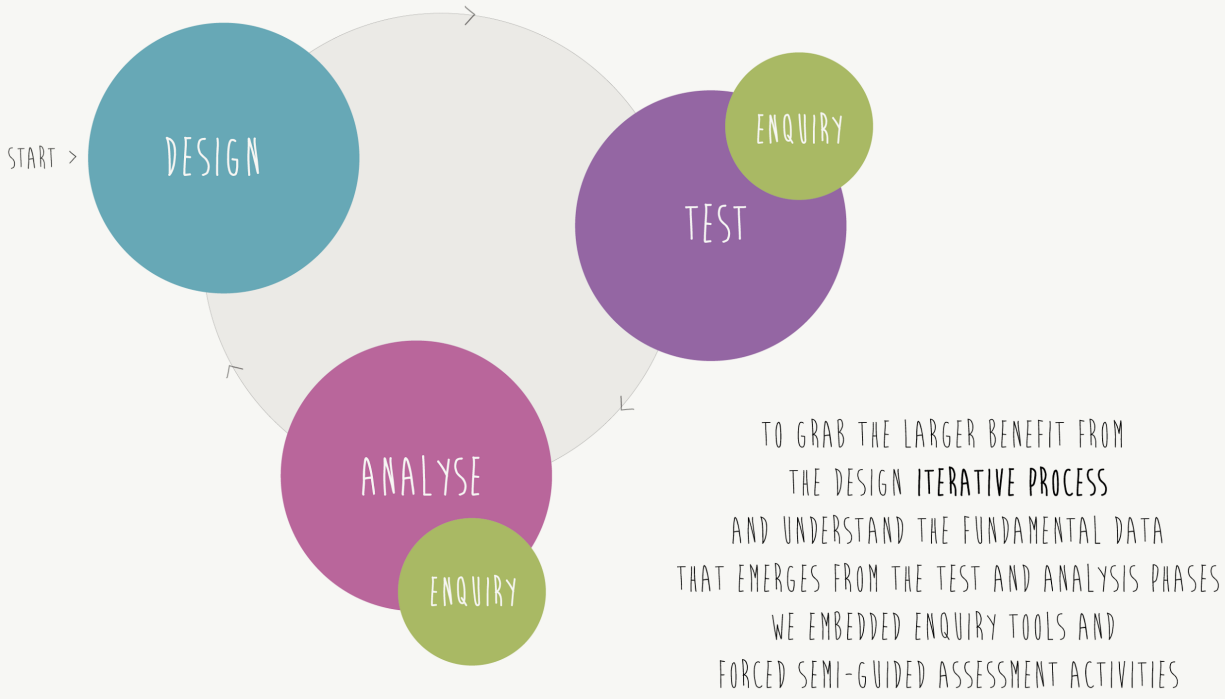


Figure 3. The design iterative process and its phases.

During the test phase, students were involved in a crossed playtest including a component of data collection: each prototype has been playtested by other designers in the roles of players, and in the meanwhile *observed* by at least one of the game designers who crafted the game tested. To support students in this tricky and delicate task, we developed a template to allow designers to conduct a focused and rapid ethnography, and we structured a questionnaire to *comprehend* the players' experience, following the MDA framework (Hunicke, LeBlanc & Zubek, 2004) as a formal approach to framing and 'decomposing' games, facilitating the comprehension of the play(er) experience. We provided these two tools with the intention of increasing the students' potential to investigate the complex and articulated experience that each game suggests.

To avoid conflicts between the attitude of playfulness and the duty to accurately prepare a questionnaire, the game evaluation was located post situ, while the ethnographies in contrast were conducted in situ and in real-time.

Provided with both tools, students were instructed on *how* to use them and, above all, *why*. We considered it fundamental to establish a direct and plain critical discourse with the class to clarify the aims of the activities and the resulting/expected benefits – focusing on the game design activity itself.

To critically observe the playtest of their own games and to collect data to consequently improve the prototype, as designers, students were asked to conduct rapid ethnographies; i.e. a template with specific instructions was provided to drive the observation of the play experience throughout the playtest session. Four areas were predefined to structure the process: (1) Ambiguity & Understandability, (2) Game Usability, (3) Emotion & Immersion, (4) Challenging the Magic Circle. In addition, a field for further comments was integrated.

Subsequent to the playtest, playtesters evaluated the games from the MDA perspective (mechanics, dynamics and aesthetics), the play(er) experience (game aspects, feelings perceived, the relevance/pleasantness of the interactions with the game elements, and so on), and self-evaluated their game experience. In so doing, they provided insights in terms of the games' playability, giving clear feedback on the game and how it answered to the designers' aims and expectations.

Figure 4. The crossed playtest activity, wherein students as players tested others' games and as designers observed the play experience of their own game.

The activities were run on all nine LBMGs designed by the groups. Data covers 52 rapid ethnographies and 70 questionnaires gathered via the two enquiries we requested for estimating the quality/effectiveness of the play experiences generated. One of our contributions therefore consists in an analysis of the game design process – and the iteration of some of its phases – as a learning experience.

The questionnaire contains four sections describing the players' in-game behaviours and their opinions about the procedural and semantic level of the game. The sections are:

- Profiling: this section requires 'yes' or 'no' answers and collects information about the players' game-related predispositions and their overall impression of the game, useful for the design team to deepen their knowledge after cross-checking questionnaires and rapid ethnographies.
- Game aspects: this section contains multiple-choice questions to depict the aspects of the experience players enjoyed the most and considered most significant and relevant.
- Feelings perceived: this section requires players to flag items among a list; then to check values from 0 to 3 on a set of sensations perceived, both positive and negative.
- Procedural and semantic level: it consists of an evaluation of the game and its various aspects, and requires players to check on a scale from 0 to 3 the level of agreement on specific statements about the interaction with the game.

One characteristic of the questionnaire method as a post-game evaluation is that it can only recall players' *memories* of the gaming experience. It thereby provides insight into the aspects that are perceived as being crucial for the whole game, viewed in retrospect. Conversely, observing the participants immediately during the process of playing allows students to identify concrete and significant situations of the game session in the very moment of their occurrence.

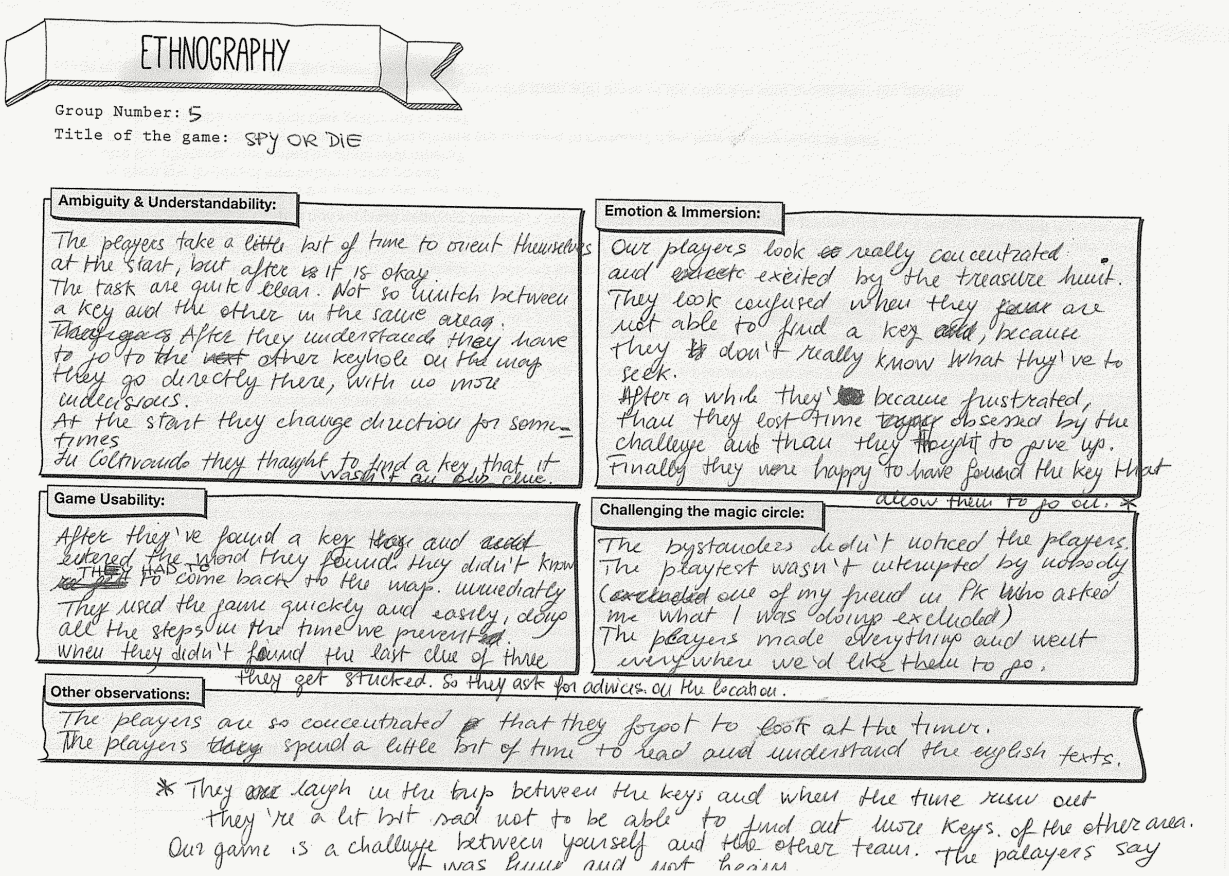
The method also provides a much more direct and unfiltered view into the experience. As the games were conceptualised as multiplayer games, the actions were accompanied by continuous communication among the participants, which is typical for co-located gaming sessions (cf. Ackermann, 2013). This created an enormous

amount of utterances resembling the data of think-aloud studies, which are quite common in evaluating game user experiences (Bernhaupt, 2015; Fullerton, 2014). Still, working with real *interaction ensembles* (Schmitt, 2013) gathering around a certain game allows for a less obtrusive analysis.

In game studies, ethnographic research methods have become increasingly popular (Apperley & Jayemanne, 2012; Ackermann, 2011; Mariani, 2016), and the practice is usually employed in a shorter and more direct form, especially getting adjusted to the specific length of the game activity observed in order to collect immediate impressions and findings during the gameplay experience. Acknowledging the benefits of examining even a quick, field-situated user experience through ethnographic research, in 2000 Millen introduced the concept of rapid ethnography.

> *[Rapid ethnography is] a collection of field methods intended to provide a reasonable understanding of users and their activities given significant time pressures and limited time in the field. The core elements include limiting or constraining the research focus and scope, using key informants, capturing rich field data by using multiple observers and interactive observation techniques, and collaborative qualitative data analysis. (Millen, 2000, p. 280)*

Students were provided with templates with which to compile ethnographies (fig. 5). The rapid ethnographies obtained were evaluated with the instruments of qualitative content analysis following Mayring (2003). For this paper, the focus was mainly put on the entries in the areas 1 (Ambiguity & Understandability) and 2 (Game Usability) that provided strong insight into the game aspects that designers underestimated during the design activity. Those aspects could mostly be identified as problematic issues in relation to the developed games. Observational notes tracked by designers depicting their own reactions to behaviours deviating from their expectations – like players finishing game tasks in an alternative sequence – gave additional insight into the openness (and also playfulness) of designers in reaction to players interacting with their own work. Students put themselves to the test, obtaining real-time, unfiltered evidence about the validity of what they designed: by participating in the play activity as ethnographers they constantly receive feedback from players. The parallelism of the activities of observing and writing down the observations only allowed for a very spontaneous fixation of thoughts, but did not leave time for further reflection. Therefore, the rapid ethnographies produced in real-time during the playtest not only revealed optimisation requirements to rectify the game systems but also gave interesting insight into the ways playfulness can work alongside assessment. Especially the inclusion of designers-as-players resulted in punctual, often sharp insights about the game, its mechanics and aesthetics, and provided practical suggestions to cope and resolve the problems that emerged.


ETHNOGRAPHY

Group Number: 5

Title of the game: SPY OR DIE

Ambiguity & Understandability:

The players take a little bit of time to orient themselves at the start, but after it is okay. The task are quite clear. Not so much between a key and the other in the same areas. After they understaced they have to go to the next other keyhole on the way they go directly there, with no more understoods. At the start they change direction for sometimes In Colmando they thaught to find a key that it wasn't an our clue.

Emotion & Immersion:

Our players look so really concentrated and excete excited by the treasure hunt. They look confused when they are not able to find a key and, because they don't really know what they've to seek. After a while they became frustrated, than they lost time obsessed by the challenge and than they thought to give up. Finally they were happy to have found the key that allow them to go on. *

Game Usability:

After they've found a key they and entered the wood they found they didn't know THEY HAS TO to come back to the map. immediatly They used the game quickly and easely, skip all the steps in the time we prevented. When they didn't found the last clue of three they get stucked. So they ask for advices on the location.

Challenging the magic circle:

The bystanders didn't noticed the players. The playtest wasn't interupted by nobody (excluded one of my friend in PK who asked me what I was doing excluded) The players made everything and went everywhere we'd like them to go.

Other observations:

The players are so concentrated that they forgot to look at the timer. The players they spend a little bit of time to read and understand the english texts.

* They are laugh in the trip between the keys and when the time were out they're a bit bit sad not to be able to find out more keys of the other area. Our game is a challenge between yourself and the other team. The palayers say it was funny and not boring

Figure 5. A rapid ethnography compiled by group No. 5 (No. E_32_G5)

Even though the rapid ethnography templates were provided with information about what to put into which category, especially the fields 'Ambiguity & Understandability' and 'Game Usability' were not really treated as distinct by students – a pattern that was probably due to the rapid pace of the activity itself. Consequently, both areas were combined in the content analysis, too. Furthermore, the emphasis was put on the negative comments, looking for patterns in the occurences, and the designers' reactions to them.

Procedure

Data was collected by 45 MSc students and used to verify/improve their games within the iterative design process. The analysis contains 52 rapid ethnographies and 70 questionnaires used as tools to enquire about nine LBMGs and acquire quantitative and qualitative knowledge. The amount of sheets collected is not equal to the number of students, because as players they tested more than one game (usually two), and as designers they observed the playtest of their own game at least twice. However, not all of them had to compile the form for every round.

Using the rapid ethnographies, student-designers collected important qualitative information, which encompassed the qualities of the play experience; on the other hand, through the questionnaires filled in by the student playtesters, they captured a large amount of quantifiable outcomes to be transformed into useful insights, too. Our point was to use mixed methods to provide student-designers with an extended amount of information for comparison and cross-checking – enabling them to evaluate the different instruments' impact on the design activities.

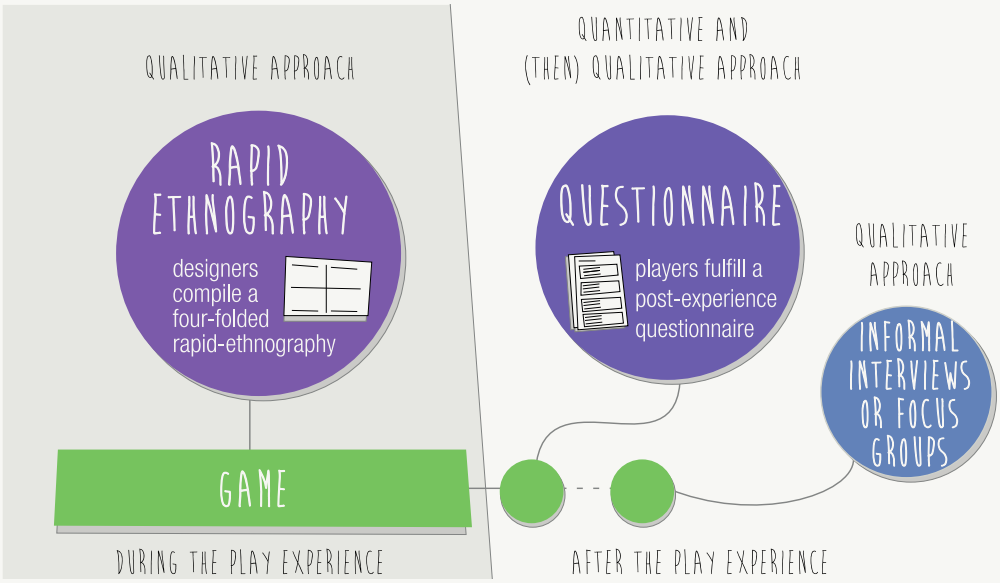


Figure 6. Strategies and tools employed, and when they were used.

Each group playtested the games of their classmates, and 52 rapid ethnographies and 70 questionnaires were collected. Such a first-hand mutual participation immediately demonstrated its validity and benefits by showing to each group several problematic aspects that affected the play experience. To lessen the distance between the actual experience and the expected/desired one, students had to cross-examine the data collected. The data were specifically analysed to identify the criticalities that determined the problematic issues outlined via questionnaires and rapid ethnographies.

Results

The data collected via questionnaires indicated that 79.9% of the players enjoyed the games 'pretty much' or 'a lot', attesting that the LBMGs designed by the student-designers were generally pleasant to play. Even though this positive assessment is grounded on a small-scale amount of data that is collected by observers who have a certain familiarity with players and vice versa, it thoroughly contributed to creating an overall climate of general appreciation and acceptance that was important for the persistence of the playful attitude. Furthermore, it constituted a fruitful foundation on which the various design teams could collect details, encouraging deeper investigations, as well as specific interventions. In particular, data showed which elements (fig. 7) and aspects (fig. 8) of the games players enjoyed the most, as well as the feelings (fig. 9) they had while playing.

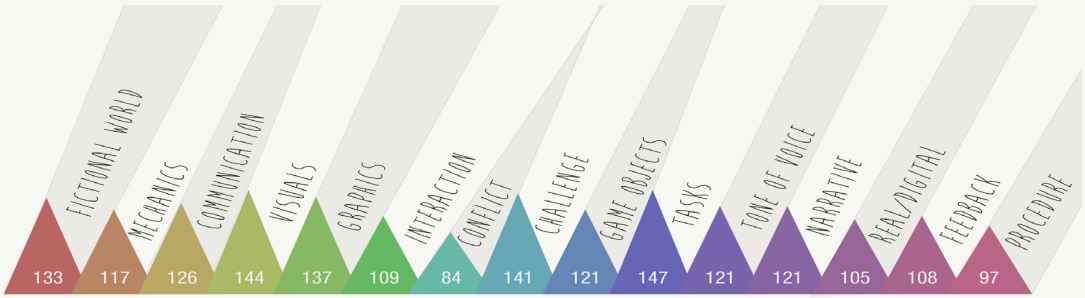


Figure 7. How much players appreciated the different elements of the game system (self-reported). Players were asked to consider 15 items and self-report the extent to which they appreciated each specific element on a discrete scale from 0 to 3. Values are the sum of the scores of all 70 questionnaires.

With the intent to collect pragmatic and direct information, the questionnaire contained an entire section asking players to express their opinion about various elements of the game system. Fig. 7 shows the results of this part of the enquiry on the total amount of games. Especially after the first playtest, students were able to compare the scores players gave to each item with their own expectations. For example, the first playtest of G8, an LBMG with mechanics similar to the well-known *Catch the Flag*, collected very high scores on the items *interaction* and *challenge*, but *conflict* received low scores, as did *communication of contents*. As a consequence, designers improved the game by reinforcing the battle between the two playing teams and adding a photo-shoot mechanic. In parallel, they strengthened the way contents were communicated, adding in-game hints delivered with each flag that was caught suggesting where to find the next one.

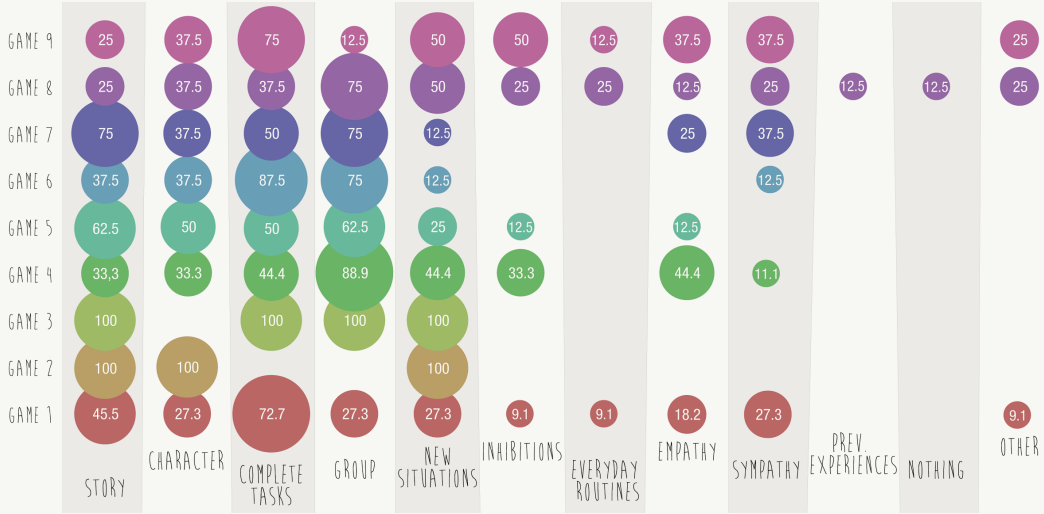


Figure 8. Aspects of the game players enjoyed the most. All values are in percentage.

Considering all games, the aspects players rated most highly were: (1) completing tasks 58.6%, (2) being part of a group 57.1%, and (3) being immersed into the story 51.4%.

Fig. 8 displays the aspects players appreciated the most for each game, showing the presence of diffused interests on common aspects, as well as unique responses related to a particular game, like the fact of running into new situations within habitual spaces or suspending their usual social role to act accordingly to the character they were embodying. It emerges that the two items linked to the fictional world (story and character) raise the highest interest in players, attesting to their crucial role in the overall experience. According to McMahan (2003, p. 68), immersion refers to the player's condition of being 'caught up in the world of the game's story (the diegetic level), but it also refers to the player's love of the game and the strategy that goes into it (the nondiegetic level)'. It is a complex concept that Murray (1997, pp. 98-99) derived from the experience of being under water, submerged and surrounded by it. As such, we can state that immersion is also connected to the coherency of the world wherein the game takes place, its narrative and its elements (Ermi & Mäyrä, 2005; Nitsche, 2008, p. 205). When designing and playing LBMGs, our students had the chance to directly experience it by being surrounded by part of the fictional world, since it overlapped with the real one. Moreover, they collected evidence to attest that by including elements typical of the performance like costumes and masks, players are more likely to achieve immersion. In particular, some groups received comments like: 'I appreciate the heroes' masks (G4)', and in general discovered the importance of identity objects as elements that clearly state 'this is a game' (Bateson, 1972), expressing a condition of belonging to a group/community. Out of the nine designed LBMGs,

seven worked with masks and/or costumes. As the integration of performance material into the games was not mandatory in the actual game design task, it can be interpreted as an indication for the presence of a high level of playfulness. As a pattern, wearing masks or identifiable objects seemed to have helped create a sense of belonging to a group and of clearly taking part in a performance. This aspect heavily empowered playfulness, as it created a sense of acting and performing in a protective frame.

Fun by design

Broadening the focus on playfulness to the whole iterative design process, we can state that those groups wherein students truly experienced what we defined 'fun by design' interacted in a more positive and fruitful way, and their games ultimately were more original, enjoyable and sparkling. Two groups out of nine showed an initial incoherence and lack of cohesiveness in purposes and commitment that largely affected the game efficacy in terms of the clarity and smoothness of the experience; since the inception, the two games presented signs of having a potentially inadequate game design, mainly due to the students' incapacity to articulate games as sequences of challenging and compelling tasks, with a strong and coherent narrative as an overall link. After the first playtest, both groups realised that the situation was problematic, and some of their premises needed to be reviewed, but just one of the groups really comprehended the importance of playtesting and listening to other players' opinions. As a result, the group that positively resolved the game created one of the deepest experiences: in G4, players were asked to cooperate and trust each other in a journey among the five senses. On the other hand, it is not a coincidence that the group that designed G3 did not translate the initial idea into a captivating and fun game, as they did not properly take part in the playtest and the subsequent activities of information exchange. The designers' attentiveness and openness towards the players' behaviours and comments here indicate a higher level of playfulness, which helped the team in fixing their game. The lack of playfulness in the other group was an obstacle for succeeding in the re-design process.

Intersecting digital and physical

Explaining the fundamentals of designing games situated in the urban context and using geoposition technologies, we asked our students to be attentive to the consequences of taking physically part in the narrative. Our students were theoretically aware that their players were going to be corporeally immersed in the fictional world, since it overlapped with the real one, and therefore that they had to physically move in the space to reach some points. However, until the first playtest they were not concretely aware of what it meant in terms of gameplay and physical effort. This is a typical dilemma of location-based games (see for example Hartmann's (2016) observations of location-based game appropriation by players). Indeed, taking part in these games, players had to move back and forward to complete tasks and missions (most of the time running, because of the challenging game mechanics). It is not a coincidence that comments on the questionnaire simultaneously expressed appreciation for the pleasant experience and critique of the itinerary length: 'More short paths because the game mechanics are fun and enjoyable (G7)' and 'shorter paths from quest to quest (G7)'. When analysing the data gleaned through rapid ethnographies and questionnaires students became conscious of the feelings elicited by the game they designed, and which elements and aspects were most appreciated; e.g., as said above, designers discovered that situated games are intertwined with the context and are subject to problems connected to moving for real in the real space.

Figure 9. Feelings players perceived during the game experience (self-reported). Players were asked to consider 15 items, self-reporting how much they felt that feeling in a discrete scale from 0 to 3. Values are the sum of the scores of all 70 questionnaires.

Especially by comparing their expectations as designers with players' statements, they comprehended their games' effectiveness. Considering the high values of feelings such as *satisfaction* and *fun*, but also *surprise* and *challenge*, it is clear that games were appreciated and considered entertaining as well as fulfilling.

In parallel, the presence of low values on the items *frustration* and *anger* is noteworthy in a double sense: frustration and, to a certain extent, anger were indeed feelings that some teams specifically intended to elicit; on the contrary, some teams did not intend to spur similar feelings, making their presence a clear statement that something in the game needed an intervention. Especially, the presence of *boredom* immediately exposed the necessity of improvements. The origin of the feeling of 'boredom' was indeed tracked in the corresponding rapid ethnography to increase the awareness and understand where the game was 'broken'. The very few observations in this area were found in the field 'Emotion & Immersion' during the first playtest of the workshop ('the players didn't feel engaged in the story and were bored', E20_G3_A3; 'The player doesn't seem motivated to complete the game. He seemed bored not interested', E29_G9_A3; 'It's nice at the beginning but is going to be boring', E30_G4_A3).

Then the quite high load of *confusion, indecision, misunderstanding, fear of failing, shame* and *powerless* – which all aggregate feelings of insecurity in different ways – can be explained on the one hand by the combination of digital and physical spaces that leads, for instance, to insecurity in the orientation, and, on the other hand, by the *occupation/invasion* of serious spaces (as some spaces in the university campus) wherein players had to perform and behave in playful and bold ways. For example, a team of players (G9) had to pretend to swim with a snorkel and diver's mask across the crowded campus library, raising curiosity as well as general amusement, and it was video-recorded and posted online. In G2 players had to ask perfect strangers to dance with them in the central garden of the campus to powerful tango music. Dealing with tasks like these raised some insecurities in students, while being and navigating in a certain familiar environment prompts reflection processes on multiple levels. This presence of multiple insecurities in the players that created a state of behavioural flexibility was also unequivocally identified via the rapid ethnography, heavily traversing all the different observation areas.

Observations from the playtest

The rapid ethnography findings can mainly be divided into two opposing problems: very specific and concrete ones to be easily resolved and very generic and vague ones requiring a much more intense examination of ways to address them. Typical problems and areas of confusion were identified in the following domains:

- Technical problems;
- Game mechanics;
- Navigation in the physical space.

Technical problems included situations with the hardware and software (WiFi connection, bugs, QR code problems),

but also players' difficulties in using the app. Designers could influence those domains to different degrees, which resulted in diverse thematisations. Concerning problems that were unambiguously caused by the app, the notes were partially permeated with strategies of trivialisation:

- '[They] had some problems with the application, but it was not annoying' (E4_G3_A1);
- 'There were some problem with the tool, but after that the game could start' (E40_G9_A2).

Other designers connected the identification of problems with a work order to their group:

- 'Still some bugs in the program to fix' (E36_G1_A2);
- 'They got stuck with a bug of "ARIS". We have to write down precisely how to overcome the technical obstacle' (E46_G2_A2).

Others already presumed the success of the adjustment:

- 'There is a mistake in first task, but we fix it' (E3_G3_A2).

Problems concerning the game mechanics can be divided into two cases: tasks and/or rules that were not clear to or too hard for the players, and mechanics that were not put together correctly. For the first case, most of the observing designers deduced explanation needs from their part:

- 'We must explain better the missions in the applications' (E11_G4_A2);
- 'Order the things to do within a quest because players don't understand when to record the video' (E41_G9_A1, translated from Italian);
- 'Requires a much more clear brief' (E22_G8_A1).

For two games (G7 and G8), the observation even led to the decision to change/simplify the game rules. In these cases, the problems were that obvious, that they occurred in several rapid ethnographies of the groups in question. Additionally, they were mirrored in the further comments in the questionnaires ('there are too many rules and things to remember', 'I couldn't remember the rules').

Furthermore, timing problems were predominant in the domain of game mechanics, showing that designers underestimated the time needed to transgress the physical space in order to fulfil the game tasks:

- 'Too short time to complete the tasks' (E26_G4_A2);
- 'The second step was too much short' (E52_G6_A2);
- 'Some locations are too far from the center of the map' (E36_G1_A2).

Also, the players' physical fitness appeared to be a crucial aspect requiring more intense consideration ('The players looked a bit tired when the second round started' E25_G6_A2).

Problems concerning the movement in the physical space included excessive distances, cases where the GPS was not accurately set, but also players who did not know where to go. Still, the different groups pursued different strategies in reacting to similar problems. Taking the example of GPS location, some students rated the problems as general malfunctions ('GPS had sometimes some problems' E40_G9_A1; 'GPS wasn't always precise enough' E57_G9_A1) while others deepened the analysis tracking it to be due to a work order ('Be more precise with objects' GPS range' E41_G9_A2, translated from Italian). The necessity of connecting the actions in the digital sphere to the concrete movements in the physical space in a way that was manageable for the players appeared to be one of the biggest obstacles for all the design teams, even if each group handled the situation in their own way. In this domain, the crucial role of the playtest became especially evident. Most of the

occurring problems in the field of players' movements could be solved quite easily through participation in the iterative design process, but would otherwise have constituted serious issues concerning the games' playability.

Dealing with unexpected player behaviour

As an interesting side effect, the way the designers framed their entries allowed them to achieve an impression of how they measured the specific aspects and the actors they see in charge. Illustrative examples of that would be the following entries: an utterance like 'they [players] didn't read all the instructions on the display or with enough attention' (E57_G9_A1) accuses the players of being the cause of problems with the game, while 'we must explain better the missions in the applications' (E11_G4_A2) clearly identifies the need for action on the part of the designers. We consider these two different attitudes toward the players and their role significant, because they express two opposite ways to exploit the test phase. In the first case, blame is put on the players and attention is directed away from the designers' responsibility of the situation. However, the latter sentence is a level-headed consideration that shows maturity and conscientiousness apart from the desire to improve the game itself by re-designing some of its elements. Turning towards the question of playfulness in both roles, the increased openness towards the different ways of addressing the games by the players facilitates a better and faster way of adjusting games

Another aspect that predominantly emerged from the rapid ethnographies reinforcing the consideration above – where we denounced that designers blame their players in spite of considering the existence of design lacks/problems – is that the designers had a clear idea of how their games should be played, and as a consequence expected the players to act accordingly. This becomes visible especially in some points in their notes, where they accuse the players of playing the 'wrong way' ('they sometimes do make some mistake', E46_G2_A2) respectively suggesting there is a 'right' play behaviour ('They didn't do mistakes', E35_G1_A2, '[Players] played it in the right way', E5_G3_A1). The terms 'mistake' and 'right way' point towards a rather normative idea of 'correct gameplay' and stand in contrast to the idea of playfulness. We consider these observations extremely significant because they are clear indicators of the expectations of the design teams; expectations that, as said, can be confirmed or contradicted. Students experienced the meaning of *emergent play* (Salen & Zimmerman, 2004, p. 539) observing how players often behave in unexpected ways. Following patterns that the design team cannot anticipate, players can bring their own strategies, interpretations or meanings to the game and translate rules in new and innovative ways (see Koubek, 2013 and Atkins, 2003). When it is correctly and deeply analysed, this practice creates the opportunity for a creative and reciprocal relationship between the designer and the player. As a consequence, it underlines the role of the test and the analysis steps in the iterative process, as well as the usefulness of the assessment tools provided.

In light of the process of data analysis, each group identified a strategy for a satisfactory resolution of the problem(s) that emerged, and a new cycle of design, test + observation and analysis was required in order to test/verify the efficacy of the improvements made. The results obtained gave the designers important insight into the playability of the games and the way they met the initial aims and expectations.

Game design is a demanding practice since it requires both excellent listening and observational skills on the part of the designers and openness towards putting themselves to the test: sometimes a player's critique of a game becomes a real blow for the designer, since it reveals a 'lack' in the design. Especially the dialogue with players discloses the limitations of the design. However, some students grasped the real meaning of the practice and translated critiques into unique possibilities, as sources of improvements (for the specific games, as well as for themselves, as designers).

Our data shows that the aforementioned strategies of coping with problems and malfunctions in the games do not appear as group patterns. Instead of involving the entire design team for each game, they rather occurred on an individual level. In this dimension, especially our aim to push students to exchange ideas within their group, founded in the rapid ethnographies as well as in the questionnaires, helped the designers to overcome their own

possible negative reactions and to re-enter a state of playfulness allowing for fast and flexible decisions and problem solving activities. This also enabled them to use the knowledge acquired and the potential improvements suggested by players or designers who monitored the playtest.

Discussion and conclusions

The aim of this contribution was to understand how far the attitude of playfulness permeates the game design process and if it influences designers' performance. A workshop was conducted focusing on the intersection of serious and playful aspects. Students were asked to design an LBMG addressing the topics multiculturalism, re-appropriation of space or social norms, and then to place the game action in the physical space of the university campus. Students in the double roles of players and designers experienced the game design activity as a field of (playful) learning and enquiry: the iterative process is both a procedure through which to validate the game system and the resulting play experience (mechanics, dynamics and aesthetics), and also a challenging situation for learning wherein learners are involved at first hand. It appeared that some parts of the iterative process (idea finding phase, playtest) were more likely to create playfulness in the students than others (ethnography).

The findings synthesised above indicate that the explorative study outlined gave students the chance to grasp the significance of developing the process thoroughly: the comprehension of the potentials and criticalities was recognised as the turning point in improving their games and making the experience more meaningful and involving. It provided the designers with important and specific insights into their games' playability, disclosing through a learn-by-experiencing process the way each game answered the players' as well as the designers' expectations and desiderata. Especially the findings from the rapid ethnographies indicate that the observation activity did not immediately prompt all the students to perform a critical analysis: their ability to individuate criticalities and levels of misunderstanding was not always a direct consequence of the playtest, but rather of reading about the feedback players gave. As explained above, designers struggled with accepting the existence of design lacks/problems, usually preferring to blame players instead.

The ability to accept failure, learn recursively and review previous expectations is a core element of learning (Mitgutsch, 2012; Juul, 2013): however, when it happens within a design practice, it requires a further state of openness to change and to *self-question* (Mariani, 2016). As shown, the attitude of playfulness supports this state of mind. Guiding students through the iterative process enabled them to actually see the results of their design activity, catch the difference between the expected and the actual play experience, and gain a deep awareness of the transformative potential that lies in the design process itself. Playfulness in this context is by no means contradictory to serious engagement with the design process. Quite the reverse: *students can indeed experience a condition of fun by design and maintain the intended learning purpose*.

In essence, our follow-ups assessed that the main contributions of the iterative process consisted in the acquisition of the following learning and awareness processes:

- A mutual participation in the playtests is a way to improve prototypes and gain consciousness. Running reciprocal playtests and collecting feedback were crucial for understanding whether a game responds to the expectations of the design team, from both a communicational and an experiential perspective, and to outline what kind of implementations it requires.
- Each group obtained important observations from those who played their game, realising that transferring a meaning and eliciting the desired play experience is a hard and complex task. In most cases, as a consequence of the first playtest, groups modified some of the game dynamics to better respond to their communicative intent.
- Each group identified slight but meaningful discrepancies between the descriptions of the experience that emerged from the two tools. A remarkable difference emerged between what designers noticed during their observation activity (producing rapid ethnographies) of their own game played by anoth-

er group of students, and what players felt and experienced playing that game (obtaining data via questionnaires).

Through a learning-by-doing and learning-by-experiencing practice, students understood the pivotal role of the test and analysis phase in relation to the development of a functioning, playful and communicative game. By intertwining questionnaire and observation data, students acquired the necessary knowledge to become consciously able to intervene on the game and apply the required changes. Answering to the second part of our research questions, the game design activity and its iterative process were effective in increasing the students' perception and consciousness of the games they designed, stressing in particular the role that the direct participation played in the game sessions, both for observers and players. On the one hand, the awareness that comes from the intersection of the data collected activates a learning process on the design process itself, highlighting the importance of the playtest as a design phase; on the other hand, the experience of participating in several other games generated a deeper understanding of the needs and limits to take into consideration.

The workshop was a demanding activity, which we ran in a very short and dense period. Considering the limited amount of time, and the fact that for the students of the School of Design it is not a frequent practice to apply the entire iterative process, employing in addition ethnographic tools, we decided to structure the observation activity and provide tools specifically intended to enquire into certain game elements and certain aspects of the play experience. In so doing, our students' abilities to observe and comprehend data were maximised, allowing them to clearly understand the criticalities of their own game and avoiding giving rise to a *paralysis by analysis* situation. The rise of a state of over-analysing or over-thinking is indeed a common condition when a large amount of data is available and the interpreters have limited experience conducting an analysis. The most sensitive phase consists in decoding the observations collected and translating them into actual improvements. The presence of too many details and interpretations would have certainly affected the decision-making process itself, preventing students from deciding how to functionally organise data and implement the prototype according to the findings.

In addition, the coexistence of a creative and a *science-oriented* process empowered designers to understand how research tools can impact on games, nurturing their minds by giving meaningful insight. As a result, designers became active and conscientious actors able to modify and shape game experiences according to their objectives in a strict relation to the players' needs and game emergencies. What is significant in order to answer the proposed question of this contribution is that students learned the importance of observation as a practice of enquiry and understanding. Moreover, they experimented with the cruciality of the result analysis as an efficient way to comprehend the play experience and thus meet the players' expectations. It was shown how playfulness helped designers develop a flexible and fresh way of coping with the playtesters' comments on their games and of overcoming tunnel vision of 'correct' and 'wrong' in-game behaviour. In addition, it was pointed out that being in the mode of playfulness supports designers in creating especially appealing experiences, going far beyond the actual tasks of the workshop (as visible, for example, in the production of special masks and costumes to be used when playing the games).

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