ICTPW

**International Conference
of Tirana Planning Week**
by POLIS University

Playful Design Strategies. The Introbots Experience: Enhancing Co-Design Practices for Inclusive and Engaging Urban Spaces with Children.

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Abstract

Western Culture has stigmatized introversion as a less desirable trait of personality especially for designers and people involved in creative activities. According to many studies, an extroverted character is considered a plus and leads to a more successful and satisfying life. But is true that introverts are at a disadvantage?

The Introbots are a group of fluffy and goofy playful artefacts that aim to create an exploration and a commentary of what it means to be introverted and to pave the way for educators and students to reflect on the misconception that extroversion is positive and introversion is a disadvantage to be corrected.

In 2018, they were the protagonists of a workshop at the School of Architecture (SOU) in Favara children, when they were used to sensibilize the young students to the topic of introversion and to empower them to design more inclusive playground and urban spaces in the urban environments. The chapter discusses the results of that experience and implicitly shows how the relationship between play and learning is not unilateral but rather biunivocal, and the playful artefacts are not just mere instruments but real tools that can help us to disclose the power of play when it comes to the design of our urban landscapes.

Keywords: *Playfulness, research through design, introversion, intelligent artefacts, architecture and children.*

Introduction

Play as a Pedagogy and Social Tool. "*At the moment of the appearance of language, the child no longer finds himself dealing only with the physical universe, as happened before, but with two new worlds, which are moreover closely connected: the social world and that of internal representations.*" (Piaget [1967] 2000, p.29).

Talking about gaming as a system of teaching and transmitting knowledge almost seems like an oxymoron. For a large part of pedagogy - and those involved in education in general - play seems to be a minefield with unexpected implications, which always coincides with the abandonment of serious things and contrasts with study, work and seriousness.

It is generally classified as something that belongs to the sphere of pleasure and desire (dynamics which however stand at the core of many manifestations of playful activity) and contrasted with commitment and seriousness. There is nothing more wrong than this. As many studies have confirmed through the decades, "gaming is serious business. Indeed, serious!" .

It is only starting from Romanticism that playful activity is re-evaluated thanks to a series of pedagogists - first of all Froebel (1887), - who begin to talk about play as an activity that educates. In their vision, the child grows by playing and learns to deal with the outside world, to accept the

unpredictability of events and to enter into a relationship with what is different from what is. This is certainly a decisive step towards a re-evaluation of play in educational systems but still dangerous because it assimilates it to a tool ready to be used in case of need and not to a tool capable of developing the creative and speculative component that we so much like interest.

For this reason, it is interesting to delve deeper into the connection between play and learning, understanding the latter as a persistent modification of a set of behaviours that involve multiple cognitive functions, including thinking, memory, and attention (Anolli, Mantovani 2011). Play is an original and significant experience of human action (Antonacci in Bertolo, Mariani 2014) and at the same time has a symbolic, polysemic, ambivalent value and generates contradictory and transformative knowledge. In recent years, an increasingly broader branch of Game Studies - and Game Design - has focused on interactive playful artefacts capable of facilitating learning, the so-called Pervasive Games . This type of games stimulates dynamics of communication and contextual knowledge and activates the physical space in which they are played. It is also interesting how their potential continues to grow as technological developments allow for an ever-increasing digital dimension of these playful artefacts and produce a real change in how we see, understand and build the world. This is a phenomenon found especially in very young people, those who are called digital natives (Prensky 2007). The latter, thanks to the potential of the digital age, have decisively changed their attitude towards the acquisition of new knowledge. In particular, they have developed a type of learning that uses metaphors and metalanguages (Salen, Zimmerman, 2004; Jenkins 2009). Nonetheless, they have developed a critical inclination to choosing types of games that aim at transmitting and sharing a certain type of content over others (Jenkins 2009), demonstrating precisely how the relationship between play and learning is not unilateral but rather biunivocal, and the playful artefacts are not tools but real instruments of thought. The learning experience that the act of play provides us (Antonacci in Bertolo, Mariani 2014) is experiential and is based on the practice of observing, imagining, and transforming the products of these perceptive actions into creative material through simplification operations, abstraction, and decontextualization of reality. Indeed, the learning phase is not only the frontal one of passive transmission of notions but the active one in which the student/student concretely tries his hand at doing. Generating significant ludic experiences means involving players on multiple levels, transmitting relevant content to them, and inviting them to reflect critically on what is experienced through the activity of playing, activating processes capable of generating intersections between ludic and ordinary through a powerful medium such as the game. The theoretical components discussed so far will now be presented in the form of a research project where the dynamics and play mechanics have been catalyzed within an intelligent device capable of activating a learning-by-playing phase to address and demystify the concept of introversion from an individual problem to a simple personality trait (Jung, 1921) in lesser or greater presence in each of us.

Fluffy Intelligent Robots. Some details on the bots

Introbots are some small and portable robotic entities endowed with an Arduino microcontroller at their core, alongside motorized mechanisms facilitating locomotion and navigation. Complementing their functionality, these creations integrate dual light sensors for environmental awareness and a collection of light-emitting diodes (LEDs) for visual expression. Furthermore, they are designed to be cute, relatable, and a bit goofy, covered in fluffy fur and with big, bulging eyes.

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[1] The quote comes from the work of the Jean Paul, French pseudonym of Johann Paul Friedrich Richter (Wunsiedel 1763 - Bayreuth 1825), German writer and pedagogist.

[2] Pervasive Games are video games where the gaming experience is projected into the real world, or where the fictional world in which the game takes place mixes with reality. The mobile game company "It's Alive" defines them as games that surround you, while Montola, Stenros and Waern in their book Pervasive Games. Theory and Design. Experiences on the Boundary Between Life and Play (2009) argue that they bring with them characters that extend Huizinga's magic circle temporally, spatially, and socially

Fig.1/ Mario, one of the Introbots

Introbots, akin to introverted individuals, exhibit a nuanced array of responses to environmental stimuli, which is represented through a certain amount of brightness, and a tendency to escape such stimuli and to search for darker places where to 'relax'. The bots are designed to deliver small games or experiences to sensibilize participants to the notion of introversion without declaring that purpose from the beginning. The whole idea behind the project is a learning-by-playing experience where the players, questioning themselves on the dynamics behind the bots' behaviour can slowly discover their personality and, specifically, their introverted traits. In the first deployment of the prototype, four participants were given a torchlight each, divided into teams of two, and led into a dark room. Four robots are waiting there, a pair for each side of the space. Their LEDs are glowing as if they're relaxing and chatting with one another. Players are told that the objective of the game is to bring the Introbots to the centre of the room, but this is much more difficult than it seems: the robots are scared of lights, they often run away, they get confused by the shadows and by the other players' torches. Sometimes they panic and start spinning in random directions until they find a dark place where they can recharge themselves from the abundance of external stimuli (light=social interaction), they have been facing. The deployment phase was organized in three different sessions, each one followed by a survey where the players were slowly invited to reflect on the bots' behaviour through some specific questions until they understood the specific personality trait they were expressing. The first sessions in Amsterdam were quite successful. Around 50 people were involved and almost 80% of them understood the purpose of the research starting from the second survey and interaction with the bots. The surveys were composed of a series of questions of growing specificity enriched by some psychological and behavioural hints.

After gathering the data, the team started to reflect on how the Bots could be used not only in a descriptive way to sensibilize towards the topic of introversion but also as a 'design' device to challenge designers towards new ways of designing public spaces and urban landscapes taking
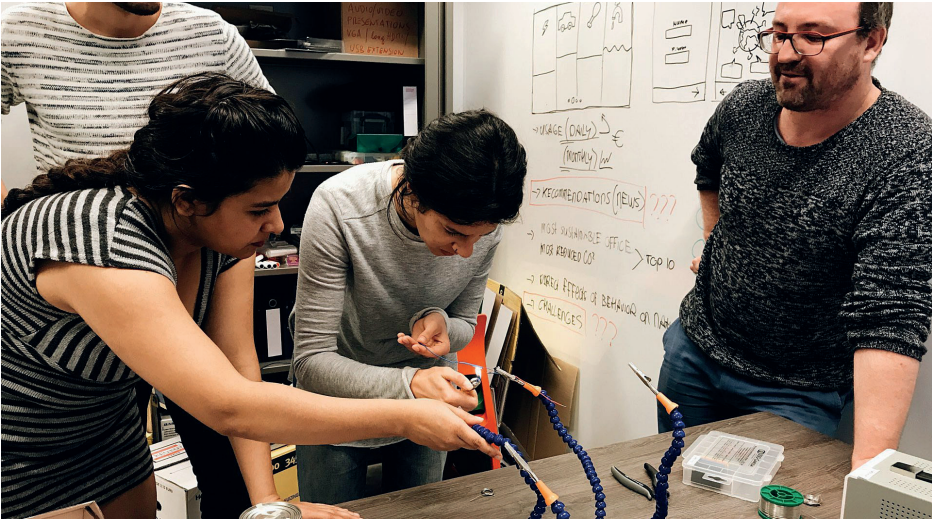
Fig.2/ The creation of the Bots. In the picture: Soldering. Anandita Punj, Beatriz Ibeas, Adriaan Oudemans, Luis Rodil-Fernández

into account the variety of psychological profile enriching them day by day. The chance for this further step came when the team was invited to an uncommon workshop in the South of Italy, at the School of Architecture for Children (SOU) in Favara, province of Agrigento.

SOU Favara. Creating Better Citizens for the Future

The School of Architecture for Children (SOU) is an after-school experience for the children in the framework of Farm Cultural Park, an independent cultural centre in Favara, a temple of art, culture and beauty.

Favara has long been one of the Italian municipalities most affected by mafia activity. Its creators, the notary Andrea Bartoli and his wife Florinda Saieva took the opportunity from the confiscation of some assets from organized crime for the foundation of the Farm Cultural School which aims to be a center of beauty in an urban context tormented by crime organized and an opportunity for redemption for citizens. To date, the Farm is one of the most influential independent cultural centres in the contemporary cultural world and one of the most effervescent projects for the rethinking and rebirth of moribund cities.

It is the winner of countless awards including the prestigious award from the American Foundation of the same name Curry Stone Design Prize, as one of the 100 international experiences that have produced the greatest social impact in the world in the last ten years. The architecture school for children therefore falls within the framework of this initiative with a very simple but high-impact pay-off: Create better citizens for tomorrow. Throughout the school year, children are invited to participate in educational modules, lasting approximately 2 days, with invited teachers from all over the world. We move from the use of sustainable materials for construction to the design of green public spaces up to experiments with intelligent sensors within urban areas. Among the guests of the 2017-2018 school year, there was also the HvA team, which was asked to organize a module that taught children how to design inclusive and sustainable urban playgrounds. The opportunity was used to focus the workshop on the research interests of the Amsterdam students, broadening the focus on the concept of inclusiveness on the theme of introversion and using robots to push the young students of the school to design not just an inclusive playground but one specifically dedicated to introvert introverts. The work took place in two phases: the first was

Fig.3/ Farm Cultural Park, Favara. The courtyard and main entrance.

theoretical where the teachers explained what a playground is and what the key elements are for their design within cities. The concepts of urban play devices were presented and the importance of designing spaces that can invite performance and unpredictability, which can push the user to freely express their desires for interaction and play. The second began with a simple request: the children's design of their playground. Blank sheets of paper, pencils and markers were provided and the young students were encouraged to draw what, in their minds, could be the most beautiful playground Favara had ever had. At this point, the robots had not yet been presented, as the first design phase had to be as free as possible from any form of external influence.

Once completed, the children were divided into 6 groups of 4 and taken to the room where the robots were waiting for them. After a short presentation (each robot has a name and its personality) the students were asked to organize a small playground with common objects - chairs, tables, cardboard boxes - and to help the robots play.

The room was in semi-dark condition so as not to influence the behaviour of the robots before the experimentation and a series of small flashlights were provided to the children. They were not told how to use them but little by little they understood that it was the flashlights that stimulated behavior in the Introbots.

After each play session, the children were asked questions about the robots' behaviour. As to why they seemed to be running away and how they used the flashlight to make them move. Initial responses to the questionnaire showed an understanding on the part of the little players that 'something was wrong' but the general impression was that the Introbots were broken or malfunctioning. Having confirmed this, the team of teachers and students suggested to the children that perhaps the bots were experiencing emotions that they could not explain and to think about this during the second gaming session. At this point, the children were invited to redesign and modify their initial park in light of the behaviour of the robots, thinking about how to ensure that they could have fun despite their 'strange' behaviour. Once finished, a new play session with the Introbots began albeit in a different way than the previous one. The children seemed more aware of the impact of light on the robot's behaviour and, in cases where the robot ran away to take shelter, rather than chasing it, they remained still and waited a few minutes before starting to 'communicate' with it again. During the second questionnaire interview (all recordings were catalogued and analyzed after the end

Fig.4/ The human team and the Introbots

of the workshop), a boy and a girl progressively revealed the mystery behind the bots' behaviour. The first at a certain point stated that his robot (Mario) is shy and needs 'time' to get to know each other and for this reason, he had decided to play with him for shorter times to give him time to get to know each other.

The little girl, for her part, began during the interview by stating that her robot (Anne) was 'introverted', meaning that, from what she knew, it needed to recharge after 'talking' to people as it was a bit shy and he also needed time to spend alone before returning to play.

Conclusions

As we have seen through all the work presented in this paper on the robots, people in Amsterdam and the children in Favara have critically engaged with the nuanced portrayal of introversion encapsulated within the Introbots' narrative arc. On one hand, the cute robots aim at raising empathy and affection in the players and, on the other hand, the game signifies how tiresome it may be for introverts to function in everyday circumstances. The Introbots are neither shy nor lonely: indeed, they start in pairs and end the game in a group in the middle - but find the process of getting there exhausting and sometimes anxiety-inducing. They transcend simplistic notions of introversion as mere shyness or solitude, instead embodying a complex interplay of social dynamics. Beginning their odyssey in pairs and culminating in a collective convergence, they symbolize the intrinsic desire for connection and communal belonging that resonates within introverted individuals, albeit amidst the taxing ordeal of interpersonal engagement. Furthermore, the Introbots beckon stakeholders within the educational sphere to engage in a discourse that celebrates the diversity of cognitive temperaments, fostering an inclusive environment wherein the multifaceted nature of human experience is embraced and celebrated. The Introbots don't offer any "solution" and don't judge anything or anyone. Instead, they pave the way for educators and students to reflect on the misconception that extroversion is positive and introversion is a disadvantage. Together with their ability to communicate and raise awareness of this topic, in Favara they also demonstrated their ability to be artefacts capable of involving people in design thoughts regarding more inclusive urban spaces tailored to the different personalities who inhabit them. After the children discovered the introverted component of robots, their designs for the playground

Fig.5/ Photos from the workshop phase.

changed significantly compared to their initial choices. In one case, a child designed what he called 'the heart of the park' as a private dark room where his robot could go to rest when its level of social interaction exceeded the permitted limit. In another, a little girl had designed a series of urban seats that could accommodate a maximum of 3 people so that her robot could control her stress level through contained and time-limited interactions. These are small experiences within research that aim to be non-solutionist and do not want to offer solutions in the form of guidelines but mainly to explore certain social and educational dynamics through play and playful interaction. Since the beginning, the work was driven by an honest curiosity to test the potential of playful artefacts to lead to some meaningful discussion on a theme such as introversion and then transform it into design material for the urban landscapes of our cities. The results of the workshop with the children of Favara showed that, even though more testing and experiences are needed, the power of play can empower and enhance younger generations deeper reflections concerning the urban spaces they inhabit.

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