Learning with Mario Bros: Living in virtual worlds outside the classroom

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Abstract: This presentation examines, from an ethnographic perspective, how a 5 year old girl performs a process of reflection and implements certain strategies from her activity in a virtual world, supported by an adult. The data come from an ongoing case study aimed at examining children's representations that they constructed from their interactions with specific videogames. We will show how videogames, considered as cultural tools, create new communication environments which can be a good school for learning to think.

Keywords: videogames, children, informal learning, popular culture, problem solving.

1. Objectives

1. To explore communication scenarios created by the presence of new digital tools, especially videogames, when children and adults interact.
2. To discover children's representations which are present in the problem-solving process required by the game, and that take place in virtual worlds.
3. To design new educational settings in kindergarten and primary education, taking as the starting point commercial videogames.

2. Situated cognition and virtual environments

In this paper we focus on the evolution of Alicia, a five years old Spanish girl, when she played Super Mario Bros in a family environment. Our *theoretical approach is rooted on social-cultural psychology.* The idea of situated cognition is relevant to us. We can be certain that if children are playing videogames and talking about them outside and inside the classroom, what they would say and the models they would be elaborating from the game would be different. Looking to complement these two models, we found the concept of *"situated cognition"* as defined by anthropologist Dorothy Holland and his colleagues [2]. Adopting that *perspective, cognition is engaged with environment, action, and expertise*. Furthermore, knowledge is not only embodied through the agent's ability to perform an action (with his/her hands) but it is also embedded in the affordances provided by the environment and which are meaningful in specific contexts [1]. Looking at the games, these affordances are present in specific settings and related to precise rules that define the dynamics of the game. This is the perspective from which we will analyze some of the following conversations between the adult and the girl [3]. *We will show how the way in which the child interprets her own activities during the game, or those of the characters acting on the screen, depend on the features of the game that she's playing, the specific contexts in which she refers to these activities –*

when she dialogues with the adult or her peers- and even on her own expertise as a player.

3. Methodology

We adopted an ethnographic approach, acting as participant observers [2]. Alicia was observed once a week for about an hour while she played with the console in her leisure time outside of school. All the sessions were audio and video recorded. Photographs were taken of the girl while she was interacting with the game and also when she interacted with other technologies, typically the computer or the Wii console.
She was 5 years and 3 months old in March 2009, when we began to follow her. In this presentation we will follow her evolution during six months *(August 2009),* and in fact we are even following her now, until she manages to complete the game Super Mario Bros.

4. Learning to solve problems using games

This was a complex process, which displayed a certain development over time. Alicia not only discovered specific rules of the game inductively, but was also able to verbalize them in order to teach the adult how to play.

4.1. Alicia's imaginary: March, 2009

Alicia spontaneously learned to manage the controllers and referred to the game by the character's name. One of her first games was LocoRoco[1]. Even though it comes from another franchise, just like all Mario games it presents a fantasy world organized around small creatures living in harmony with their planet and taking care of the plants. Alicia, when she began to play this game, alternated with those offered by the Mario series, especially Super Mario Bros.
After some spontaneous play sessions we asked her to make a drawing of what she liked most about playing with Mario. Looking at her drawing we noticed that several characters from children's culture were present, although we had asked her to focus on just one, Mario. Even when asked to draw a picture relating to the Mario Bros game, she went further in her drawing, combining the worlds of different games and even television shows. Her production illustrates all the fantasy worlds in which the child's everyday heroes lean, not only on the game but also on certain Disney series, such as Hannah Montana nowadays. Furthermore, her drawing not only includes characters, but also elements related to the puzzles and challenges of the Super Mario Bros game and which appear at the bottom left of the drawing.

4.2 The child as an expert problem solver (August 2009)

The analysis of the child's conversations with the adult shows complex strategies for solving problems, especially relevant if we take into account that she was still unable to

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[1] http://en.wikipedia.org/wiki/LocoRoco

read. Her statements are a sign that she is aware of the actions that she must take to achieve her goal "not to kill it and to advance through the world of clouds", therefore she needs to establish relationships between the control and the action she wants to perform. She discovered things by herself, despite being unable to read, she tried various buttons and several alternatives until she understood the mechanism which linked the corresponding button to a concrete action. Moreover, the first descriptions that Alicia makes on her own show that she was aware of the presence of certain rules. Even more, she is able to verbalize her strategies to the adult. She understood that the mushrooms lets Mario get bigger or smaller and only then, Mario can go from one world to another not only through the clouds, but also going through pipes, etc. But it is still possible to go one step further: Alicia is able to teach the adult how to move across the screen in anticipation of what might happen.

5. Why and how can Mario be present in Early Childhood or Primary education?

If analyzing Alicia's activities when interacting with the game teaches us something, it is certainly that she wasn't wasting her time. All the time she was forced to reason and to solve specific problems. Our main question now is, why do schools not take advantage of these resources? By playing the game, Alicia, a five year old girl, was maybe much more motivated to read (to discover special instructions present on the screens). At the same time she was developing other abilities related to solving complex problems that will be very useful in her future life as a citizen of the twenty-first century.

We can ask once more how video games may be used in the classroom. Answers may be multiple, all complementary. Finding information about the game can be the first step. Another important aspect will be to decide which console to use. The small Nintendo DS is perhaps the most appropriate for very young kids because its controls are easily handled by children. They can even bring them to the classroom to play in small groups, organizing the class activities around small projects.

Finally, they may imagine that Mario is already in the classroom. A pre-assembly to generate reflection, asking questions that generate interest, will help children to understand that they can also learn with Mario. After the game session, the general discussion, explaining what happened, including video projections of the game, will help to raise awareness of the problems to be solved, and above all, to re-formulate, to discover the way to solve them and, in the end, to encourage thought and reflection.

6. References

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