

EDULEARN¹¹

3rd International Conference on Education and
New Learning Technologies

Barcelona (Spain) - 4th-6th July, 2011

CONFERENCE PROCEEDINGS



PHILOSOPHY AS A FOUNDATION FOR CHILDREN TO PLAY WITH SCRATCH IN KINDERGARTEN

Ana Patrícia Oliveira, Maria Conceição Lopes

*University of Aveiro, Department of Communication and Arts (PORTUGAL)
[apoliveira@ua.pt, col@ua.pt]*

Abstract

Scratch from MIT Media Lab is an application and visual programming language that allows children to play with each other mediated by a computer. In opposition to video games, in this software program children are authors and producers of their play and games.

The “Scratch’ando com o sapo na infância” (Childhood with Scratch in motion) project promotes the use of Scratch programming for children from 4 to 6 years old. In this way, they can learn to play with Scratch and they can play alone with other children.

The intervention-training-experiencing with Scratch occurs at the Kindergarten of Cooperativa A Torre in Lisbon and consists of two phases, the first is conducted with children from 5 and 6 years old and the second one is accomplished with children from 4 and 5 years old.

This article intends to describe and make clear the second phase of intervention with children, their parents and educators. The second phase involves advising and tutoring strategies carried out by the researcher that provides the children’s decision of choosing with whom they want to play in Scratch.

Keywords: Philosophy, education, communication, children, Scratch.

1 INTRODUCTION

New media offer opportunities and challenges to promote communication and ludicity in childhood, because children play with them, cooperate and make critical judgments about what they do as authors and producers, contributing to the affirmation process of their autonomy.

The use of Scratch application from MIT Lab is the example that will be discussed in this communication. The children, through play, can experience their ludicity condition mediated by a computing device, which offers them the possibility, in the authors’ role, to interact socially, create stories scripts, cooperate and share projects, think creatively, discover computer programming, training logical thinking, and develop interpersonal relationships.

The “Scratch’ando com o sapo na infância” – Childhood with Scratch in motion project is developed with kindergarten children and aims to show how Scratch can promote 21st century literacy children’s skills with the mediated intervention of parents and teachers, and also to develop children critical literacy.

The Scratch sessions happen in the classroom with the support of the kindergarten teacher, are integrated into the educational process and are linked to the teacher conversations with children about Philosophy for Children [1].

After the discovery and familiarization stages, when children have already know the main concepts of Scratch programming and the researcher-trainer supports them by responding to their requests (tutored autonomy), children playing and working all together in Scratch from the chosen source of inspiration. This source is the book “O Segredo do Rio” [2] (The Secret of the River) by Miguel Sousa Tavares, that children are exploring with kindergarten teacher on literature and philosophy sessions. The Scratch projects that result from this activity are shared with parents and school community.

2 ACQUISITION OF LEARNING AND THINKING SKILLS

2.1 The potential of Scratch visual programming

Scratch application, which is based on programming languages like Logo and Squeak, and it allows, especially children and teenagers, create and share interactive stories, games, music and web animations, profiting from the participatory spirit of Web 2.0.

Children, through the simple programming tools available in Scratch, have the possibility to practice their logical and scientific thinking and explore their creativity, while these capabilities are applied on building and development of projects. These projects may be developed offline through Scratch application, or on the community site (online) where children can share the projects, clarify doubts and learn more with the users' community.

In order to achieve these purposes were established design principles, that guided the development of Scratch and the strategies used to make programming an activity more accessible and engaging. These core design principles are essentially three: make Scratch more intuitive, more meaningful and more social compared to other programming environments [3].

Rusk et al. [4] advocates that new generation, with Scratch, develops 21st century learning skills, such as information and communication skills, thinking and problem-solving skills, and interpersonal and collaboration skills. Thus, Scratch programming is a privilege medium for promoting learning and developing different skills of children and youth in a pleasurable and interactive way.

Today, in addition to writing, reading and logical-mathematical thinking domains, new skills are required to properly use and manipulate new technologies and achieve a more efficient and effective communication.

Scratch enhances the acquisition of those new skills related to media and technological literacy, since it enables the creation and manipulation of several types of media (image, text, music and animations) by children and youth, and promotes creativity and critical analysis about the media that they observe (communication skills).

When we are programming in Scratch, the skills related to critical thinking and systems thinking are developed through projects building, because children and youth need to coordinate the timing with the manipulation of different sprites (graphical objects that can be programmed), allowing them experience systems and technological concepts such as interactivity and feedback.

The creation of a Scratch project requires that children or young people conceptualize an idea and then be able to decompose the problem into smaller actions by aggregation of the programming blocks. While users create the block structure, they can also dynamically change code segments in real time and view the results of their actions. In this process of conceptualization and design, users experience, identify, formulate and solve problems interactively.

The creativity and intellectual curiosity are promoted by Scratch use, because young people are challenged to look for new solutions to new challenges as they arise, not limiting to understand and solve pre-defined problems. Furthermore, the collaboration and interpersonal skills are equally encouraged, since the users are able to work together in building projects. The Scratch objects, blocks and code are modular and can be easily accessed, read and shared in contrast with other programming languages (Fig. 1).

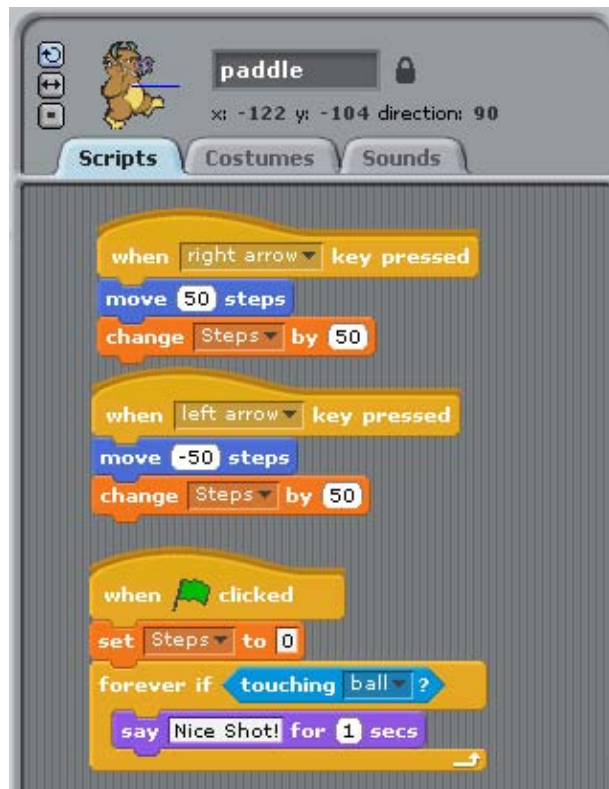


Fig. 1 – Blocks construction area in Scratch application

The self-direction is also a skill that is present on important and relevant projects that young people develop. The creation of an idea and the problems overcome on the conception and development process generates an intrinsic motivation that helps young people to achieve the aim of challenges.

Since Scratch is an open programming environment, the community can change and contribute to projects of other users, so young people must be able to take responsibility for what they create and adapt themselves according to the reaction of other users. In terms of shared experiences that contribute to their learning environment, young people can generate discussions about important issues to them, but that may also contribute to the Scratch community.

Thus, it is considered that the Scratch programming is an innovative technology that promotes communication and playing (privileged manifestation of ludicity), and improves communication, creativity and ludicity skills.

2.2 Philosophy for Children

According to Lipman [1] the "Philosophy for Children" consists in doing research with them and it is important develop informal philosophical conversations with children in contexts outside the school. The introduction of philosophy in the children's world is also important, because it is representative of the human thinking heritage, promoting the rationality and critical spirit of children and preparing them to think and interact.

The program "Philosophy for Children" aims to provide children the development of a more reflective, observant and critical thinking enabling them to discuss and make choices. Lipman argues that this program differs from the conventional education system, since the latter is limited to propose and develop the learning of particular skills, comparing this system to the tribal societies' model.

The information-acquisition model that dominates education, rather than encouraging children to think for themselves, is a failure even on its own terms, for we are constantly appalled at how little our children seem to know about the history of the world or about its political and economic organization. The effect of the tribal model is to stifle rather than to initiate thinking in the student [1].

The author became interested in "Philosophy for Children" topic when he was a University Professor of Introduction to Logic and Theory of Knowledge courses. At that time the philosopher was able to identify the lack of students' motivation on these classes, in addition to the difficulties inherent to its low agility of thinking, reading and understanding philosophical texts.

In the 60's, studies developed by the University of New Jersey corroborated Lipman's findings, highlighting the deficiency in promoting and developing analytical thinking of students and producer of alternatives.

By the end of 60's, Lipman published his first philosophical book for young people in the literary genre of novel (Harry Stottlemeier's Discovery [5]) this was the first of a series of teaching resource books that are part of the "Philosophy for Children" program.

Lipman argues that the cognitive abilities and thinking should be encouraged on a continuous and systematic way, from the earliest years in which children are in school system until later in the university. Thus, the "Philosophy for Children" program, according to Lipman [6], aims the "education for thinking" in science and knowledge level, but also of social, cultural and moral level.

Also according to Lipman, the human being should use a higher order of thinking to apprehend and understand the world around him, in other words he should "think carefully" [6]. This concept involves an ability to think and argue precisely, through which the human can capture and attribute meanings. The author also says that the biggest change to be implemented in the school system is preparing students to think for themselves and not only learn what other people have thought, thus, children will be more motivated to "think carefully" if they attribute meaning to their experiences, specifically in the classroom context.

In Lipman's view, the philosophy is the vehicle that allows children to reflect on it as discipline, but also enables them learning to think critically and actively about their own thinking (metacognition).

3 THE LUDICITY CONDITION

3.1 Spontaneous social playing: a ludicity manifestation

According to Lopes [7], the concept of ludicity is defined as an essential condition of human that is manifested through the everyday experiences such as play, game, recreation, leisure and build ludicity and creativity artifacts. These manifestations are dependent on an explicit or implicit contract established between who interacts. From this contract the protagonists of the situation establish an order in social interaction that is the ludicity.

Lopes [7] believes that the ludicity phenomenon to be understood, must be studied taking into account the three dimensions of analysis, specifically the dimension of the humankind condition, the dimension of its manifestations, and finally, the dimension of their effects.

The concept of spontaneous social play is defined by Lopes [8] as "the privileged co-production process of the learning of humans' social relationships, and also a ludicity manifestation".

The ludic manifestation of playing integrates the spontaneous social playing that proposes new strategies and contributes to understanding the co-learning social process of the autonomy performed by children through play.

Playing is one of the most evident cultural manifestations of childhood, and when children play, they actually enjoy that. There are clear signs in playing that the common knowledge appropriated throughout the time, these signs are giving account what is playing or not and revealing guidelines about this phenomenon so well known and yet so misunderstood.

Through ludicity, and more specifically by SSP, children have the opportunity to incorporate values, develop them culturally, assimilate new knowledge, and develop autonomy and creativity. Thus, children can find a balance between real and fantasy, being able to create through play.

According to Lopes [8], the SSP is the affirmation process of children autonomy in relation to their daily routine, emphasizing the SSP role in the social and cultural development of children. In this way, the SSP emerges as the communication and experience strategy that consolidates the autonomy and cooperation among children, and among children and adults.

The SSP occurs always spontaneously, suggesting a variety of learning and changes in all the participants involved. Thus, the SSP is revealed as a ludicity manifestation of human that results of co-produced learning.

The SSP conceptual framework evolves over seventeen propositions based on Bateson's ludic metacommunication theory [8]. These propositions are elements that contribute to the distinction between the SSP manifestation and the ludic manifestations of play, recreation and leisure.

The humans, who spontaneously and deliberately engage themselves in SSP, do not expect reward, only intend to stay in the agreement that initially assumed, defining the rules of interaction and interrelation among them.

4 METHODOLOGY

4.1 Action Research Methodology

According to Lewin [9], the action research methodology is an interactive and spiral research process that focuses a problem. This methodology, as its name suggests, aims to get effect both in the field of action, as in the field of research. It is appropriate for this research because is an *in loco* procedure (in this particular case in the kindergarten context) which all participants (including researchers) observe, analyze, ask and readjust certain aspects, providing a continuous and iterative collaborative work.

In order to reveal the inter-mediations carried out by the researcher in the co-participated intervention, Conceição Lopes [7] presents the representative scheme of ludical and social interaction of the researcher co-participation with the developed actions and children (Fig. 2¹).

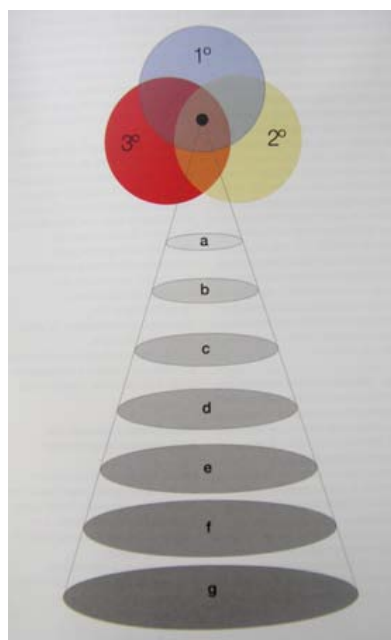


Fig. 2 – System of the inter-mediations carried out by the researcher in the co-participated intervention plan

¹ Operating procedure of the interactions and interrelations: 1st circle - Researcher – Mediator: integrates the researcher and kindergarten teachers who mediate children, while they play with Scratch; 2nd circle - Mediatizing: refers to the communicational, ludical and creative action through the Scratch programming application; 3rd circle - Mediatized: identifies the situations experienced by the project target group. The a, b, c, d, e, f, g, h areas correspond to the promotion stages of spontaneous social playing with Scratch and to the construction stages of co-participated learning and change (co-participatory octagon).

4.2 Methodology of Ludicity Design

In order to achieve a better understanding of the object of study, it is applied a second methodology in this investigation: the methodology of ludicity design. According Lopes [7], the ludicity design triad places the entire system of creation, conception, project, intervention programming and evaluation that follows the construction process of ludicity design, which begins with the excitement and the feeling of *desire* ('desejo'), turning into the *intention* ('designio') and finally becomes operational in the *drawing* ('desenho') (Fig. 3).

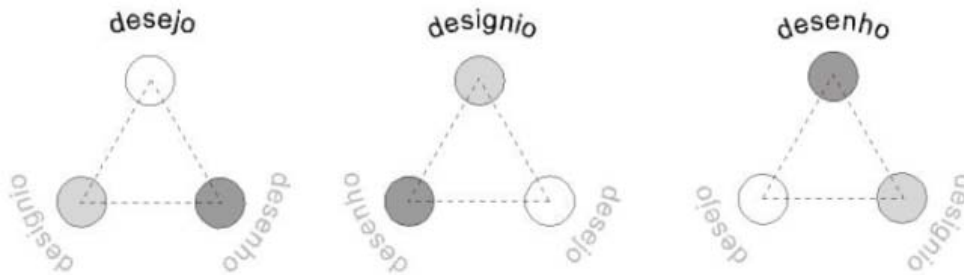


Fig. 3 – Ludicity Design Procedural triad: desire, intention and drawing (Lopes, 2005)

Lopes presents the ludicity design as a methodology that breaks with the classical cognitivist methodology, relying on the definition proposed by Gaston Bachelard [10] of methodologies "*intuitive cosmogonies*" which put into practice speculative activities such as imagination and creativity. "*The ludicity design fits in these methodologies*" [11].

Thus, the ludicity design triad is developed from a conceptual and methodological framework that promotes communication between the three processes (desire, intention and drawing), in an interactive way, through various correlations, forming an open system.

5 RESULTS

5.1 The children's experiencing with philosophy

The Scratch sessions of intervention-training-experiencing with children from 4 and 5 years olds aims the children support and tutoring by the researcher, with a view to the learning of Scratch application functionalities, as well as the discover of what children in this age group do when they play with Scratch, and finally it is intended to identify which are the strategies that children use to manipulate the application functionalities.

Thus, Scratch was introduced into the kindergarten regular activities of children and at the classroom space, and was assumed as a support of the educational process. After the phase of familiarization with the Scratch application, children have rediscovered the Scratch guardians (characters) "Pópia", "Pópio" and "Friends who came from afar" that they helped to create in 2009.

Children were challenged to use the program as a tool for building projects, whose contents have been motivated by the stories of the "Scratch in motion" heroes (available at <http://kids.sapo.pt/scratch/formacao>) and the book "O Segredo do Rio" that children have been working at the Philosophy for Children sessions.

The story of the book was divided into twelve parts, and these parts compose the Scratch animation script to be performed by twelve pairs of children who are part of 4-5 years old children group. In Fig. 4 is shown one of the Scratch projects developed by two children.



Fig. 4 – A part of “O Segredo do Rio” story created by two children.

6 FINAL COMMENTS

Analyzing the results obtained until now, it is believed that the Scratch, as a computer application, is a primary toy to early childhood education that allows many games and creations among children and involves many effects like the social learning of 21st century literacy: read-write-count-programming-play-create, enabling the connection between ludicity-work-study-creativity. In addition, children were challenged to "think carefully" and to use his knowledge and philosophy thinking to build the animated story from “O Segredo do Rio”.

This research work is based on the strategic intervention of ludicity, creativity and communication and aims the literacy promotion and the development of learning skills related to media literacy. For this purpose it was used the Scratch tutorials and characters “They came from afar” (*Vieram de Longe*) and “A day in the farm” (*Um dia na quinta*) available at <http://kids.sapo.pt> site.

Therefore, this research contributes to the discussion about new media, in the logic of its effects, which are enriching children experiences and inter-generational sociability, and are activators of new communication strategies, ludicity and creativity that are supported by digital platforms.

REFERENCES

- [1] Lipman, M. (1988). *Philosophy Goes to School*. Philadelphia, Temple University Press.
- [2] Sousa Tavares, M. (1996). *O Segredo do Rio*. Editora Relógio d'Água, Lisboa.
- [3] Monroy-Hernández, A. and Resnick, M. (2008). Empowering kids to create and share programmable media. *Interactions Magazine (ACM)*, 15, 2, pp. 50–53.

- [4] Rusk, N., Resnick, M. and Maloney, J. (2003). Learning with Scratch, 21st Century Learning Skills. Lifelong Kindergarten Group, MIT Media Laboratory.
- [5] Lipman, M. (1971). *Harry Stottlemeier's Discovery*. Institute for the Advancement of Philosophy for Children, Upper Montclair, New Jersey.
- [6] Lipman, M. (1993). Thinking Children and Education. Iowa, Kendall -Hunt Publishing Company.
- [7] Lopes, C. (2003a). Ludicidade. Edição Universidade de Aveiro e Civitas Aveiro.
- [8] Lopes, C. (2003b). I Encontro Internacional dos Direitos Humanos. Actas da Conferência.FCG. Lisboa.
- [9] Lewin, K. (1946). Action research and minority problems. *Journal of Social Issues*, 2, 34-46.
- [10] Bachelard, G. (1995). *Le nouvel Esprit scientifique*. Paris, PUF (1ª ed., 1934).
- [11] Lopes, C. (2005). Design de ludicidade: do domínio da emoção no desejo, à racionalidade do desígnio, ao continuum equifinal do desenho e à confiança que a interação social lúdica gera. Livro de Actas – 4º SOPCOM.
- [12] Lopes, C. (2008). Ludicity: A Theoretical horizon for understanding the concepts of game, game-playing and Play, in Thomas Conolly and Mark Stansfield (eds). University of West of Scotland, Paisley, U.K; published by Academic Publishing International, pp, 275-283.
- [13] Monroy-Hernández, A. (2007). ScratchR: sharing user-generated programmable media. Interaction Design for Children Conference, Aalborg, Denmark.
- [14] Buckingham, D. (2003). *Media Education: Literacy, Learning and Contemporary Culture*. Cambridge: Polity Press.
- [15] Papert, S. (1980). *Mindstorms: Children, Computers, and Powerful Ideas*. Basic Books, New York.
- [16] Prensky, M. (2005). Computer Games and Learning: Digital Game-Based Learning. In Raessens, J. & Goldstein, J. (Eds), *Handbook of Computer Games Studies*, Cambridge: MIT Press.
- [17] Resnick, M., Maloney, J., Monroy-Hernández, A., Rusk, N., Eastmond, E., Brennan, K., Millner, A., Rosenbaum, E., Silver, J., Silverman, B., and Kafai, Y. (2009). Scratch: programming for all. *Commun. ACM* 52, 11, pp. 60-67.