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Logo in the basic school: a continual perspective reconstruction

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Abstract

Colégio Pedro II is a Brazilian Federal Government public school. That has been working with the Logo Language as a perspective of working on a school practice where the strategy of problem solving and a final product elaboration are used to build knowledge.

This paper shows the experience that has been successfully developed at this school. The users of the Logo Language are children from 6 to 10 years old oriented by their teachers and the staff of the Educational Computer Laboratory.

Keywords

Learning - Constructionism - Curricular Integration - Interdisciplinarity

1. Introduction

The work accomplished with the Logo Language by the Educative Informatics Laboratory team from Colégio Pedro II, Unidade Escolar Humaitá I, along with the initial class up to the 4th grade students, have been trying to reach the integration with the activities developed by the teachers.

The classes in Logo environment are projected according to the goals and contents foreseen to different grades. We work with projects or activities where the main goal is to use technology to develop the capability to solve problems, to face challenges and construct a product as a representative synthesis of the learning process.

For thirteen years of this work, from the practice and the theoretical study reached, we have constructed different strategies of Logo language utilization, attending some premises that the experience has showed us.

The different moments of the cognitive development that we work with, and the necessity of making the work attractive and significant for the curriculum development, have made us construct different strategies according to the child's age.

The spiral learning experience (Valente, 2003) provided by working with Logo for itself, does not guarantee the space in the proposal accomplished with Informatics in the school. It is fundamental that it is integrated with the classroom projects and that attracts both the students and teachers interests.

For this reason, we always invest in the realization of courses about the Logo language for teachers and managers, because only from the comprehension and domination of the language they would be able to understand and propose the utilization with the students.

In this paper, we are going to do a general description of the work that we have developed with the students from the initial class to 4th grade from the fundamental education, with children from 6 to 10 years old and we are going to point out the results that we consider significant.

2. A curriculum practice built with Logo

2.1. Colégio Pedro II

Colégio Pedro II (CPII), founded in December of 1837, was inaugurated with the presence of the Emperor D. Pedro II. Located in Rio de Janeiro, constitutes a federal autarchy from the Education Ministry of Brazil, whose mission is to minister the public and gratuitous teaching for the fundamental and medium level, acting with students from 6 to 18 years old. CP II's history is mixed with Brazilian's education own history, specially in regard of the public teaching. Its trajectory is detached as a Brazilian citizen former that honors the institution name.

CPII is a scholar complex composed nowadays, by ten School Units situated in different districts in Rio de Janeiro, attending over 13 thousand students.

The work that this article refers is carried through in the school Unit Humaitá I, by the laboratory of Educate Computer science – LIED team, that attends the quantitative of 500 students of fundamental education, with children from 6 to 10 years old, with a staff of 40 teachers.

2.2 Description of the work

Logo's work with was initiated in CPII together with the LIED history. The LIED team is composed of specialists in the area and that also had been extending their knowledge on the language parallel to the teaching action.

We began taking care of students with behavior difficulty in classroom and that in front of a computer were more attentive, concentrated and able to produce.

Later we were extending the attendance to other students, in the same order that our computational capacity grew. We had two challenges: the resistance of the teachers to the computer and the learning of the language so that they could, at least, understand the work. We chose as initial strategy to conquer the students, obviously, very receptive to the

computers, especially, because we are talking about a public school. Then, we were obtaining physical space in the development of the curriculum, in the schedules of classroom, but still with a proposal that was being build isolated. However, as the Educative Informatics team was constituted by school professors, experts of the proposal pedagogical, with a previous practical in normal classroom, we could develop proposals that integrated itself with the objectives foreseen for the grade. This was a variable that approached, of certain form, the teachers, because they were able to identify in the Logo classes the concretion of objectives of its plans.

We have given courses on the Logo Language at different moments of our trajectory in the LIED and have enabled some professors, who had added themselves to our team in the deepening to the understanding of the proposal and in the construction of new ideas.

Today, we work with projects or activities where the main objective is to use the technology to develop the capacity to solve problems, to face challenges and to construct a product (Papert, 1994) as a representative synthesis of the learning. So that Logo is inserted, effectively, as a tool for the development of the curriculum, it is not enough to remain itself in the scope of workshops with the language. It is necessary that it has continuity during the years of scholarity of the students; integration with contents, objectives and projects of classroom (Almeida, 2002); integration with others softwares; and magnifying of the formation of the professors in Logo.

2.3 Characterization of the work

The LIED group has acumulated knowledge and understanding on the Logo Language, along the years of work, by means of studies and discussion carried through in the context of the school, with other professors and inside of the proper group.

We were able to observe the possibility of integration between Logo and the work with others softwares and to improve the use of the own language resources. This results in a more audacious practice, allows the students to understand their thought, and learn with their own mistakes.

We work with the students since the first schoolyear, consisting of 6 years-old children, who are learning to read and to write in Portuguese. There is a continuous work with them till they finish their fifth and last schoolyear of our unit. They work every year with a project in the computer using the Logo language. This uninterrupted practice allows the pupils also to extend their knowledge on the language and to learn to think based on this structure.

The insertion of the proposals on the curriculum happens in a ampler context of work, that conceives the use of the computer to assist in the innovation of school (Valente, 1999) and, therefore, as tool for the development of pedagogical innovatory practices. We have been using Logo associated with others softwares inside projects developed with students and teachers, as well as tried to explore the different possibilities of association of the language, the graphical editors, use of images, sound and animation.

This work in association with the class is much more productive with teachers who are capable in the language, being able to understand and, many times, proposing activities and even overcoming the LIED group in the knowledge and construction of proposals, being able to dominate more widely the programming.

In our experience with Logo, we observed that the children have stages of understanding of the language.

The child that is learning to read, finds obstacles working with the commands, than they are the representation of the actions through written word, which they don't know.

Observing the own characteristics of the age of 5 to 6 years old, we aimed to work with the perception of the space around, the difference between right and left, the quantification, the numeric estimative, amongst other curricular contents. The ludic approach with the use of screens created by the LIED professors, turned the challenge presentation more attractive and amused. Initially, the children use buttons programmed for the locomotion of the turtle, drawing in the screen, exploring the space. We use simple commands that animate the screen. Playing they understand with time that they can make the turtle do anything, since they use the commands the turtle knows. To make a simple drawing they need to analyze the situation that they desire to represent, to use the right command, and to analyze the result for a new choice of commands.

In the following classes, when they already dominate the writing, this obstacle does not exist anymore, and the child can concentrate its performance in what it desires to produce.

It seems that when working in a direct way, the pupils are able to make the relation of cause and effect. This organization of thoughts is not so complex as the programming way, since the product of the command, being a step by step way, has a immediate result needing a smaller necessity of abstraction.

In the programming way the depuration of the ideas is based on the capacity of the child to work abstractedly. It is of great importance in this process, the ability of, after analyzing the result of the procedure, to return to the previous steps in the program, identifying the modification that are needed to reach the goal.

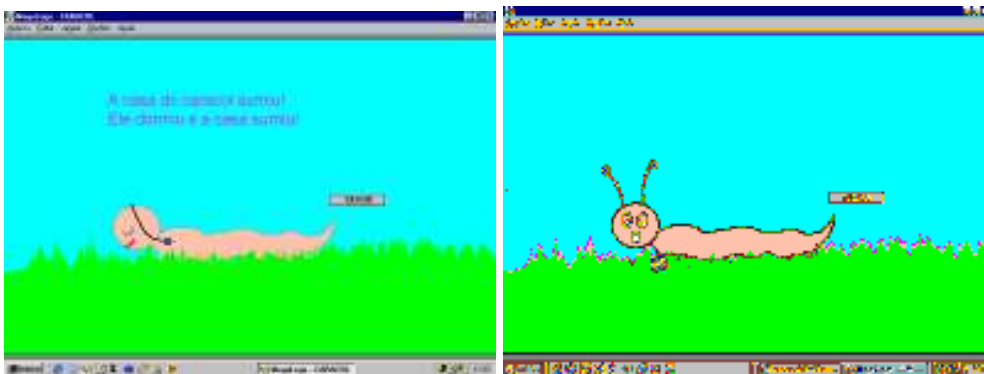
This knowledge permits us to define strategies that assist the children in the construction of concepts.

The lessons in Logo environment are planned in pocsese of the contents and objectives of the activities. We chosed to work with projects, where the general lines are explained to the students, who develop them in accordance with their interests and capacity of operation. The child construct its knowledge according with its projects of thought. The teacher should make questions that estimulate internal questionings about the study object in the child.

We continue presenting some proposals that evidence these principles discussed previously.

2.4 Logo in the different grades

In the initial class we try to stimulate the knowledge of the Language Logo in a ludic way, presenting proposals created by the LIED teachers, always in the perspective to win a challenge and to construct something.





1st grade - 7 years old children

In 1st grade, the groups were working with the subject Folklore with the class teacher and with Arts. The particular interest, in Arts, was the handicraft, composition through the repetition of forms. Then we proposed a research in the Internet on folklore, more specifically on handicraft. They had been able, amongst other things, to observe artisan works where the pattern repetition was present.

The challenge was each student create its own pattern, using as tool Megalogo software. They had created the model in the Megapaint, with subject folklore. Later they used the command **REPEAT** to make a screen all printed with this figure. We took the advantage to initiate the notion of multiplication from the repetition of more concrete figures. Finishing, we proposed the children to print a blouse with the drawing that they had created. Then, they had been printed matters in transfer, pressed, made an exposition of t-shirts and each one took its blouse for house. Beyond the work of construction of concept with Megalogo, the use of the computer was important so that the children could create the pattern repetition, activity that presents difficulty for the children involved in the project.



Fig. 1 –Screen of the pattern created by a student in the Megapaint



Fig. 2 - Screen of the turtle with the command **Repeat**

3. Conclusion

This article shows just a slice of the work we realized with children of 6 to 10 years in a perspective to integrate the computer to the development of the school curriculum. We had as main axis during the project, the learning and the construction of students knowledge.

We have shown the conduction of this work and the development of a practice using the language. It is always permeated by the basic fundamentals of Logo, reporting the cognitive development. However, each new year of work, we reformulated it based on the new experiences.

We detach the importance of the continuity of this work with Logo during every schoolyear, while they remain in our school unit (first five school years); the integration of the proposals of work to the class project; exploration of the possible resources to be associated to the programming; and association to others softwares for the development of a project.

Registering some proposals developed by the students, we tried to demonstrate a methodology based on the resolution of problems, challenges and construction of a product.

The formation of the teacher in Logo is very important so that this proposal accomplishes in a deeper way. This allows, not only understanding of the proposal of that the team of Educative Computer science, but also makes possible the construction of a practice with the language.

The work with Logo is always a positive experience for both sides, teachers and students. The more the teacher is confident about using the program the more he stimulates the students to work more creatively and freer.

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