

# **PROUCA IN BAHIA: DIGITAL INCLUSION EXTENDED TO STUDENT'S FAMILY**

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## **ABSTRACT**

The development of Information and Communications Technology (ICT) has been revolutionizing contemporary society, in this context the school is called to embody these resources not in a uncritically way or as an auxiliar resource of teaching, but as potentiator of knowledge construction. Brazilian government, through educational public policy, has been disseminating uses of ICT in schools, trough educational programs as PROINFO and PROUCA, this last one aims to distribute educational laptops in the form 1-1 (one-for-one) to children. This research sought to comprehend pedagogical practices in the perspective of its consideration as being or not a teaching innovation practice and if it promotes effectively a digital inclusion of students families. It is an ethnographic qualitative research which has involved 10 teachers and 30 students through interviews and participant observations. It was decide to use content analysis as data analysis technique from the perspective of Seymour Papert's Constructionist Approach, theoretical base of support for analysis of the results. The study showed categories as: knowledge construction, practice changing, limitations and difficulties, habilities, autonomy, collaboration and authorship, whereby was possible to comprehend the object as a potenciality whereas the percistence and alternatively search were present in the gradual overcoming of limitations and obstacles which appears during the research.

**keywords:** PROUCA;educational laptop; Constructionist; digital inclusion; pedagogical innovation

## **1. Introduction**

The present research has as object of study the programme One Computer per Student (Um Computador por Aluno - PROUCA) and it aims to identify, according to the constructionist theory and analysed in an ethnographic perspective as a participant observer, some elements in the practice of using this technology in the school with the expectation of unveiling whether such use can be considered from the perspective of an innovative practice and whether it promotes effectively digital inclusion of students and their families.

In order to do this, as basis, the following questions were considered:

- With regard to the use of the laptops-Uquinha in the school, what indicators may be considered as practice of innovation?
- How the use of the laptop – Uquinha has promoted digital inclusion of the students and their families?

The verification of changes and transformations, following the methodological guidance suggested by FINO 2008, was the parameter here adopted, in order to identify the pedagogical innovations, as well as the ways that families of students interact and use the laptops were taken as indicators of digital inclusion.

The collected data were analysed with the technique of content analysis (BARDIN, 1979) and it was used to identify categories as improvement of knowledge, changes, autonomy, collaboration and authorship. From the data, it can be realized the potential of the process to be studied. Since, the most obvious was the persistence and the search for alternative to overcome the limitations and obstacles.

## **2. Theoretical basis: Constructivism**

The Constructionism is a learning theory developed by Seymour Papert, and it concerns the acquirement knowledge through computer mediation, more precisely Logo programming Language. It aims at a learning process where the student himself/herself traces his/her trajectory.

In consonance with the Constructivist<sup>1</sup> theory, the Constructionist learning advocates that the student learns by doing, constructing the object of his/ her interest through computer, in a pleasant way.

According to Fino e Sousa(2003, pp.2051-2063, our translation)

[...] constructivists argue that knowledge is constructed by the learner and not provided by the teacher who, at most, can provide information or paths leading to it. It is the responsibility of the learners the task of transforming the received and independently sought information , in knowledge, through complex psychological processes, which always redound to the new arrangements leading to (new) Provisional balances.

The Contructionism's goal is to build learning with minimal teaching, in other words, the students make their own path, which enable meaningful learning, becoming autonomus and producer of knowledge through the connection of the newand their previous experiences.

TheProcess of interaction with the computer in the Constructionist aproach is designed in 4(four) steps: 1 - description of the problem solving in terms of programming language, 2 – the performance of the description in the computer, 3 – the considerations about what was produced and 4 – refining the knowledges when searching for new informations or new thoughts.

As for Piaget(2000), also Papert, knowledge is built and, from this perspective, education is to provide opportunities for children to commit themselves in creative activities that foster this constructive process. "A melhor aprendizagem ocorre quando o aprendiz assume o comando".Papert (1994,p.29)

### **3. Methodology**

This is a essentially qualitative research, based on ethnography. It was conducted in a municipal school of Bahia,situated in a municipality of Irecê in the state of Bahia in Brazil, which was granted with some laptopof the

<sup>1</sup>According to this theory the children construct knowledge from the moment they interact with the object in the environment in which they live, thus leading to learning. (Piage, 1972p, our translation).

programme Um computador por aluno – PROUCA (One computer per student). The ethnographic method was chosen because its essence in the description of the culture and human achievements, through:

An inter-subjective dialogue, which takes place between the actors that populate a school context, and narrated "from within", as if by someone who also becomes actor to speak like one of them. (FINO,2008,pp.45-53, our translation).

The data were produced through interviews and participant observations.

The ethnographic interview is a way which there is an exchange that is not, as the conversation named field, spontaneous and dictated by the context. It put two people face to face, whose roles are defined and dissymmetricals: the one who leads the interview and the other one who is asked to answer and talk about oneself. (LAPASSADE,2005, p.148, our translation).

Participant observation is one of the techniques that can analyze processes in order to record significant points of the subject under study, and it requires the researcher dedication and participation in the chosen community. According to Lapassade " the participant observer have to strive to acquire a member knowledge".(LAPASSADE,2005,p.70, our translation). This effort is very worthwhile,because by favoring closer ties it builds trust and respect between the researcher and the researched.

For data analysis it was used content analysis,a technique that seeks to know what is behind the words on which focuses, Bardin(1970,p.44) about the identification of categories due tojudicious grouping .

The categorization is an operation of classification of elements of a group, by differentiation, then, by regrouping according to gender (analogy), with pre-defined criteria. The categories are rubrics or classes, which bring together a group of elements (log units, in the case of content analysis) under a generic title, this group is made because of the common character of these elements. (BARDIN,1979,p.117, our translation)

Categorization allows the raw data are processed in order to be transformed into understandable and eligible materials.

#### **4. Data analysis and discussion of results**

The elements of analysis, extracted from interviews and observations,offered subsidies for the elaboration of answers that most approximates the reality. They gave substance to the categories: change in

practice by teachers and autonomy and, collaboration and authorship, by the students. Such categories, pervaded by interest in identifying the answers as they relate to the contribution offered by Uquinha on construction of knowledge to the point of consideration as pedagogical innovation and aimed a digital inclusion served as tools for validating findings.

It was found on the field activities practices through acts such as: shoot, record, edit, produce texts from oneself reality, which besides promoting the construction of knowledge, it allows integration of students in the digital world in the ways in which reality presents itself. The use of laptop in this perspective refers to Constructivist conception, not least because: "the prospect of Papert pointed to the creation of a tool that when delivered to learners, it may boost their possibilities to learn, and learning beyond the curriculum" ( SOUSA & FINO, 2008,p.7, our translation).

The urgency of the category, difficulties and limitations revealed that the operation and limitations of the equipment represent restrictions on its basic use and as pedagogical innovation. As reported in the speech of Teacher 8:

I barely use it. Considering my technological difficulties as well as the teaching and learning of children in anticipation of literate them, but I realized that the children want more and I could not their expectations. (Teacher 8)

Reports confirm the existence of restrictions, especially in the question of the processor and storage that cause slow access to the programs, as well as the time of use which causes wear on the gadget, not to mention the constant crashes causing the so-called X error, as pointed out by some of the teachers and also students speeches.

[...]one of the most frequent defects that happens is the small screen LCD burning is the other weak point of it is that the battery chargers which are presenting defects and the plug-in, the plug that connects to charge the battery, on most laptops with defects is this, the system that crashes damaging the files and then does not restart anymore, does not restore at all (Teacher 5)

Here at school when it arrived we received with much enthusiasm, we had many difficulties because the Uquinha has some secrets that took us to learn along with the children, It had things they learned first than us to get involved. (Professor7)

When something new comes, it excite us, we think it will be done wonders, but over time we'll calming and facing the difficulties, stepping back a little, the use has been far less. [...] Planning is delicate because not all we plan we can put into practice because the unrest of the children, their agitation it just don't work as we planned. (Professor 9)

I think Uquinha is very slow at the time of researches (Student 11)

Difficulties with the X, and I just think Uquinha is slow to load (Student 12)

It can be seen in educational planning activities that still remain concerns about the act of teaching instead of learning which hinders the effectiveness of the inclusion of laptops on the planned actions.

It also perceived some remnants of a traditional pedagogy in teaching practice and this has become a complicating factor, because the pedagogical use of the laptop requires a different methodology, in which prioritizes the student as an active subject; however it turns out on that speech na evidence of teacher domain under the student and therefore considerable distance of an effective pedagogical innovation proposal.

Despite the problems caused by the limitations of the equipment, such as bugs in the system, little storage capacity, problems with wi-fi connectivity and others, it found the insistence of teachers who intended to be an innovative, by the assumption of attitudes of seeking alternatives to overcome the issues addressed such as the establishment of a true network of consultation and mutual assistance among themselves.

Practice changes were categorically present in the testimonies of teachers. They are themselves whom signaling the use of technology as a driver of the need for change in teaching practice.

[...] But it was very good its arrival at the school and its activities, it was need to change, but now it was a change for the better. [...] We had the opportunity to have the technology in our classroom in our hands, the children are learning much more. (Teacher1)  
I realize some changes since it is a new instrument of encouragement which facilitated, helped our work (Teacher2)  
Technology itself makes you change, the teacher's posture changes and the technology just came to help. (Teacher3)  
I can say that the UCA project is a benchmark in Duque de Caxias School it has contributed to improve the methodology of my classes. Our curiosity is usually aroused by the new and we should not fear to face the challenges that are always emerging. The classes became much more productive and participatory after the UCA project at school (Teacher10)

The speeches of teachers show that the use of technology in the classroom produce changing, however, implied in the speech, it is clear that "change" is linked to "new" instrument, feature. There is no recognition of indications that the differential is not simply the technology in the classroom, because the technology itself does not produce change.

The change is expected requires breaking practices rooted in traditionalism, in the transmission of information. Change practice is in a constant process of evaluation, reflection and action. According to Fino it is common in some speeches that ICTs are "changing the school" but if there is no real "transformation and change" of these practices that can be considered as a pedagogical innovation, not profit its use in the school context, as what:

[...] The very embodiment of ICTs as well as the incorporation of previous technologies such as cinema, TV, etc., has not served to change much of the status quo. In most cases, the incorporation of technology in school modeled as the industrial paradigm has accented the assumptions of this paradigm (FINO, 2011, pp.29-48, our translation).

It is evident that the teachers' reports does not raise plausible arguments of a real paradigm shift, because, as the author says, usually incorporating a given technology enhances or reinforces the traditional paradigm, and this is noticeable in the speeches of the subjects, which conceive the use of technology as "teaching aid".

Some posts in the jornal report about the methodology in transmission:

**Theacher G.** ask the students to choose the savana model and to expect the next commands, then he shows in the projects the outline, the choice of layout, some children can not find. The teacher G explains again and addresses to the children that were failing to display and hide the outlines. Children are told to do the title slide 1 by typing "my job plus the region that they would work in each group." Ex: North, Northeast, Midwest, South and Southeast (logbook, November 06, 2013.)

It is true that still there are traditional methodologies evidence present in the school: They still can not disentangle the "old practices". It also was witnessed in a class with the use of slide show. There is a journal log about this activity.

Basically the presentations were very similar, the children only read information from the slides. Only one or other child would add something new. It was also observed, at the time of the presentations, many unruly students who insisted on side talk. The teacher said several criticisms concerning the behavior of some students who were not cooperating and drew them attention that all aspects were being evaluated and that would affect the note (field diary, December 10, 2013)

When the technology in school reinforces the practice based on a transmissive model, it is not consistent with the proposed pedagogical innovation. What is observed is that there is a repetition of the "old school

education" disguised in a new guise, since the pedagogical innovation implies paradigmatic change discontinuity. Therefore, we must consider that:

As everyone will understand, innovation does not lie in technology itself, but in what it allows us to do with its help. The technology will only be a pedagogical innovation tool from the moment that it allows you to do different things, when it opens doors to unexpected territories, that may not have anything to do, even with the curriculum or school. (FINO, 2007 , p.7, our translation).

The teachers commitment, demonstrated in their attitude when they innovate and create opportunities for their students, suggests their identification as a teacher in the real context of change, an innovator.

The pedagogical innovation can only be put in terms of change and transformation. School transformation and its manufacturing premises, at least at the micro level, so, at the place where there are learners, assisted by teachers who are committed to ensuring, according to Seymour Papert (1993), the maximum learning with minimal education. In other words, pedagogical innovation undergoes a changing in the teacher's attitude, who pays much more attention to the creation of learning environments for their students than the is traditionally common, centering them, and in their activities, as an essential part of the process .(FINO, 2011, pp.29-48, our translation).

It is a known fact that the relationship of students with the technological apparatus is already quite amicably and this should be channeled into teaching practices in order to be a contribution to construction of learning.

While at school innovation is increasingly difficult and a complex case, the students practice out of school, show how this generation is open to new learning situations.

Below a picture of the activity reported by the teacher, where students left the "school walls" , interviewed some residents about the theme environment , using the Uquinhas .



figura 01Fonte: E.M. Soldadinhos do Futuro

So with the pedagogical use of the laptop through projects, contextualized, teacher and student turns information into knowledge in a dynamic, innovative and seductive way. Connecting them to the world and creating new ways to overcome the constant challenges.

The following picture illustrates an activity in which students research about the Brazilian regions and transcribe the information to a notebook.



Figura 02 Fonte: própria

Among the activities most practiced with uquinha, the most frequent are games, reasearches, drawings and paintings. But the writing activities also stood out, especially the production of poetry. Of course children love painting and drawing, which are activities that draw that audience.

Papert says:

When a child uses the computer as a way to express his/her criativity, what they do is as real as if it was made of wood (if you want to be less thorough) much more real than, let's say, running a ballet or the recitation of a poem.

(PAPERT,1997,p. 265, our translation).

In relation to digital inclusion of the students' families, the suspicion that the simple fact of being allowed students take the laptops home, does not guarantee that someone else than the students have access to the equipment. It prompted us to survey them about the activities developed at home, and if they've had the opportunity to teach their parents.

The responses indicate diversity of operationalizations, from the act of connecting the computer and turning it off to the act of using the text editor or unlock the "xizinho" which requires more complex procedures as it displayed in the chart below.



Gráfico: 03 Fonte: própria

(Have you ever taught your parents how to use it?

Turn on/off 22% – Use text editor 29% – Use cam 18% – Use internet browser 16% – Use calculator 2%– Unlock “Xizinho” 2%)

Children, when in contact with these features, can quickly find its functionality and at the same time, give their explanations of how did they managed to reach the discovery. It occurs especially in families where the parents are still beginning with those features and, therefore, end up being helped by their children. Papert (1997, p.123,our translation) even states obstinately that "parents should learn from their children."

## 5. Conclusion

The pedagogical innovation, as explained in this work, still constitutes a reality in transformation, therefore, it is noticeable that the surveyed actors have a significant desire for change which is evident in their speech, however the bonds, which holds traditional pedagogies are uncontested.

Regarding the enforcement of the functionality for digital inclusion, however, the findings were favorable, it was demonstrated in the teachers actions and in the students interactions with their family, especially with their parents, occurred with the use or mediation of the PROUCA's laptops.

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