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Brazilian teachers' agency in a web-based U.S. reform project

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ABSTRACT

The paper presents the results of a qualitative study about teachers' participation at the enactment of a U.S. web-based learning project aiming to reform Brazilian public schools by advancing the meaningful use of digital technologies at public schools. The analysis was conducted along theories of agency (including the concepts of fields, resources, schemas). Results indicate teachers' agency as a key element in the reform enactment given the lack of other resources (technology availability, training, funding). Teachers engaged with the project as they understood the need for action and change, but it is not clear how far teachers' dispositions to do so would endure given the dilapidated structure of public schools in Brazil.

Keywords*: Agency, teachers, reform, learning project, Brazil.*

INTRODUCTION

This study revisits the issue of teachers and school reform based on digital technology infused initiatives by investigating schools – and their teachers – that appear to lack experiences and material conditions to the development of teaching and learning practices connected the use of computer technologies. These Brazilian schools are immersed in a social and cultural setting in which computer technologies have been defined as a highly valuable commodity[1]. Given the lack of financial resources to timely provide the large universe of public schools with computers, the few schools that have received the machines acquire a higher status within the system (these schools are often visited by public authorities, they are invited by the government to participate in innovative tech-based projects, their work is praised by media reports). This means that schools' communities, particularly some teachers, want to have computer technologies at the schools (as it will be elaborated along this paper) despite their lack of availability given to economic constraints.

Therefore, the absence of extensive available technology and the desire for its implementation within educational practices creates a tension, which leads to the hypothesis that teachers and other members of "resource-poor" schools may have a great interest in utilizing computer technologies for teaching and learning despite their scarcity in the school. The question then becomes,

> which elements and actions are mobilized by teachers to bridge the gap originated between the lack of experiences and material conditions to achieve such a goal and teachers' desire to engage and use these computer technologies?

The present study pursues this question by investigating teachers from three "low tech" schools in Brazil to explore what happened when teachers were invited to participate on a United States web-based learning project that assumes the existence of high quality computer technology availability for teaching and learning. This assumption derives from the fact that the web-based learning project was initially designed to take place in U.S. and Japanese schools, where computer technology and the familiarity with these machines seem to be widespread.

The study explains how teachers have managed to bridge the gap between their desire to participate in a "modernizing" experience in education (represented by the use of computer technologies), the scarcity of computer technologies at these Brazilian schools, and the high demands posed by the U.S. web-based learning project (as it will be detailed later).

Teachers' contextualized actions are interpreted and framed within concept(s) of agency. The theory of agency is relevant to this study to explain important elements in teachers' enactment of the learning project transferred from the U.S. to Brazil, despite the enduring reality of lack of resources at public schools.

PUBLIC SCHOOLS, REFORM AND COMPUTER TECHNOLOGY IN BRAZIL

In 1997, the Brazilian federal government launched the Programa Nacional de Informática na Educação (National Educational Computing Program). The goal established by the federal government was to have 30,177 computers installed in public schools around the country (Diretrizes, 1997)[2]. The program is still under development and, while many schools have received computers, there are still challenges to implementation. Yet, the availability of computers in public schools opens other possibilities for new experiences by teachers and students, beyond the initial lines proposed by the federal government program. It is possible that computer technology availability offers important opportunities to be appropriated by some teachers, who are willing to interfere in the scenario of stigmatized K-12 public education in Brazil (Algarte, 1991; Patto, 1999; Siqueira, 2000).

The Web-Based Learning Project

The federal government initiatives to "modernize" education in the presence of computer technologies can be represented by the enactment of the *RiverWalk* project at Brazilian public schools since 2001. *RiverWalk* was developed in the U.S. and intended for U.S. and Japanese schools. My initiative (adaptation and translation of all project materials into Portuguese and the project's local implementation at public schools) originated *RiverWalk Brasil*. The project can be implemented as an elective course at K-12 schools or it can be infused into the curriculum. It provides a web-based learning environment and a human network that connects students and teachers with their peers within Brazil. Teachers and students investigate a river and take "virtual tours" and field trips to learn about the river. At one school students learned about the causes of fish mortality in the local river; at another one the project was developed around the issue of illegal buildings and their impact on the river's flow and nearby environment. The project's technological capabilities include web-publishing tools that allow teachers and students to create their own electronic narratives in the form of a basic web page.

Teachers coordinate the project at various levels, in the classroom and at the computer lab as well as activities outside the school (e.g., field trips). Teachers also share experiences with remote participant teachers by email and online chats. Teachers are supposed to master the website publishing tools and to coordinate students' work throughout the main steps of the project; help develop initial questions to guide inquiry; provide historical background of the problem to be investigated; search the Internet for information; organize the field trip for data collection; organize and synthesize collected information; coordinate students' development of the narratives; and help publish these materials on the project's website.

The project's enactment in Brazil posed challenges since its beginning. Schools held very weak computer technology infrastructures. Generally speaking, few teachers have received specific

training about how to operate such machines and even fewer teachers have had the opportunity to experience using these technologies to teach[3]. Given its nature, the *RiverWalk* project required a much higher level of computer expertise and a stronger familiarity with these technologies, let alone teachers' abilities to run a learning project that included exchanges with other schools, field trips, planning and design of complex narratives.

The mismatch between the nature of the project and its basic requirements and the difficulties of schools, teachers and students configured a gap of knowledge, experience and practices. Although such gaps are usually bridged with initiatives such as new policies for additional professional training and work under specialists' close guidance, that was not the case. The lack of resources endured throughout the school year. Still, teachers enacted the project.

AGENCY: THEORETICAL ASPECTS

The interplay and the tensions between structure and agency as mutually constitutive has come to be seen as a fundamental issue in modern social theory. Giddens argues that agency "does not refer to a series of discrete acts combined together, but to *a continuous flow of conduct* [of human beings in society]" (1979, p. 55, emphasis in the original). Emirbayer and Mische follow the state that:

> *"agency itself remains a dimension that is present in (but conceptually distinct from) all empirical instances of human action; hence there are no concrete agents, but only actors who engage agentically with their structuring environments" (1998, p. 1004).*

Fields, resources and schemas are key concepts related to theories of agency. Fields consist of an unforeseen system of social relations among human beings within certain regularities mediated by historical conditions and power relations. Bourdieu and Wacquant explain that:

> *"a field may be defined as a network, or a configuration, of objective relations between positions. These positions are objectively defined (…) by their present and potential situation (situs) in the structure of the distribution of species of power (or capital)" (1992, p. 97).*

Examples of a field are the public school system, the church and political parties. One's movements and achievements within and across fields constitute agency.

Sewell elaborates on two types of resources: human and nonhuman:

> *"nonhuman resources are objects, animate or inanimate, naturally occurring or manufactured, that can be used to enhance or maintain power; human resources are physical strength, dexterity, knowledge and emotional commitments that can be used to enhance and maintain power" (1992, p. 9).*

The author points out that resources are unevenly distributed in society and that at least part of some resources can be controlled by all members of society, no matter how oppressed those members may be. This means that a situation of lack of resources can be transformed by social actors willing to attain new resources to fulfill their goals. This transformation constitutes agency.

Various authors have defined schemas in ways that complement and elucidate each other. Emirbayer and Mische define schemas as "corporeal and affective as well as cognitive patterns; they consist in the interpenetration of mental categories, embodied practices, and social organization" (1998, p. 975). Sewell arguments that cultural schemas are:

> *"not only the array of binary oppositions that make up a given society's fundamental tools of thought, but also the various conventions, recipes, scenarios, principles of action, and habits of speech and gesture built up with these fundamental tools" (1992, p. 8).*

According to Sewell, based on practical and normative judgments, schemas can be selectively and creatively generalized, transposed or extended to new situations when the actors face opportunity to do so.

Actors' access to resources within and across fields and actors' transposition and extension of schemas indicates forms of embedded agency that have been defined as serious game(s) (Ortner, 1996). According to the author, the concept of serious game(s) aims to capture simultaneously the following dimensions present in social practices: social life is culturally and socially constructed; social life consists of multiple interrelated webs of relationships; the presence of agency, meaning that actors play with skill, desires, goals, knowledge and intelligence.

I have developed the concept of agency under the assumption that any individual has the potential to go beyond social, economical and institutional "constraints" posed within a certain society by taking actions in their daily lives according to cultural understandings. This potential holds given that the structures are never totalitarian. The existence of fissures in the non-hegemonic structure allows one to reach his/her potential and to stretch the boundaries and the meanings of ordinary life, reinforcing and changing the social structures by mobilizing, transposing and extending schemas and by accessing resources within and across fields.

It is through thoughts, actions and language situated in cultural practices that agents (individually or collectively) engage in serious game to access and to use available resources (symbolic and material). The use of resources allows the realization of one's imprint within the complexities of social life and it transforms cultural practices. This imprint is contextualized and goal-oriented. Agency is embedded in an in-motion cultural context; it is enacted by agents in tension with societal structures to respond to the contingencies of their lives. *RiverWalk Brasil* enactment's particularities are conferred by these dynamics that will be detailed in the Findings section.

METHODOLOGY

The qualitative study (Bogdan and Biklen, 2003) was conducted in 2003 from March to December[4]. Various kinds of data were collected and an interpretive analysis (Erickson, 1986) was conducted.

Research Questions

A promising approach to the challenges presented by the *RiverWalk Brasil* case is one that problematizes the intricacies of such an initiative by posing the following questions: What does it mean, for teachers situated in a school system historically marked by extreme difficulties, to be afforded the opportunity to participate on a U.S. web-based learning project associated with school reform and modernization? How did teachers deal with the gap between the demands posed by the U.S.-developed learning project and the actual local conditions of the school in which they taught? What is the relationship between teachers' experiences of the gap between the lack of resources and project goals and their actions to bridge that gap, that is, their configuration of agency?

Participants

Focal teachers were selected from a pool of 12 participant teachers based on the geographical location of the city where they work (different regions in the country). Two schools are located on the outskirts of large metropolitan areas and one is located at a poor neighborhood of a medium size city — students are from working-class families. The study incorporates less extensive data from other teachers (see Table 1).

Table 1: *Focal teachers*

	School 1	School 2	School 3
Leading teacher	Maria	Roberta	Claudia
Teacher's area	Literature	Social studies	Science
Region	Northeast	Southeast	South
School students	1,900	1,800	2,000
Students in the project	25	36	19
Computer Lab	9 PCs	10 PCs	12 PCs
Internet	5 PCs with dial-up/ dedicated phone line	10 PCs with dial-up/shared single phone line	2 PCs with DSL connection
Internet availability	Brief interruptions through out the project	First 2/3 of the project	Last 2/3 of the project

Note: All names are fictitious.

Data Collection and Analysis

The data set consisted of email exchanges with teachers from participant schools in Brazil throughout the school year (collected and organized thematically); teachers' written participation in chats (online exchanges) was also documented; semi-structured, one-hour-long telephone interviews with the three focal teachers were conducted. During the research, analytical memos were written to register routine activities and events.

Open coding was conducted to describe the nature of teachers' agency as they joined *RiverWalk Brasil*. The coding addressed questions such as what are the participants doing? What are their concerns? How does what they are doing vary with conditions? What do they see as their constraints and their possibilities? (Emerson, Fretz, & Shaw, 1995).

Analysis is sorting out the structures of signification (Geertz, 1973). This step led to selecting, integrating and organizing codes in order to develop more focused analytic language or categories. Multiple categories were interrelated in order to develop assertions about what had happened by looking for key linkages among various items of data and typical events (Erickson, 1986). Multiple readings of the data set materials were performed. The goal was not to look for themes; rather the interest was in identifying potential commonalities across the three focal teachers and also across other collected materials. This constituted the beginning of inductive analysis. Later some of these notes were developed in short paragraphs. Attempts were made to

associate excerpts of the data to what appeared to a theme. Parts of the raw data were clustered around these paragraphs.

An interpretive narrative was developed. It was based on the data and it evolved by these key ideas. This narrative was later expanded to the Findings section of this paper. The diversity of kinds and sources of data and the presence of multiple perspectives on the data was strictly observed. The goal was to incorporate multiple kinds and sources of data and multiple participants' perspectives to build a unified narrative.

FINDINGS AND DISCUSSION

This section was developed around two main topics in the data: the reasons why teachers engaged in the enactment of the *RiverWalk Brasil* project; and the actions originated from teachers' participation.

Reasons for Participation

The Deconstruction of Stereotypes

Currently in Brazil it is commonly said that public school teachers are second-class professionals that ended up on that job "for the lack of a better one." Maria (see Table 1) explained that teachers like her have been blamed for the impression held by many "that students from public schools have no perspective in life, that they don't like to learn, that they don't like to think, that they are not interested in their communities." She thought that this mistaken representation of public schools is a serious issue. Claudia reassured the quality of her teaching practices by explaining that "I tell them let's think about it, let's develop the [chemical] formula on our own. I am not going to put out all the information on the blackboard so that you can copy the pre-made summary. We are going to construct our own summary. In the beginning they struggled, but now they are well adapted to it." Roberta said that "even though I hate my [low] salary, I like challenges [such as the *RiverWalk Brasil* project]."

These teachers' narratives constitute a renewed perspective about the negative common sense about public schools in Brazil. Maria, Roberta, Claudia and the other participant teachers volunteered to take the lead in their schools and to work as informal coordinators of *RiverWalk Brasil*. There was no direct financial compensation for them and the time dedicated to it did not count as part of their official workload. According to them, the participation in the project was an opportunity to develop new teaching practices. This allowed them to fight back against the frustration of being defined as "second-level" professionals. In this case, the structure of the public school did not limit many teachers' actions developed in connection to the *RiverWalk Brasil* project, which will be detailed next.

Building a Sense of Distinction

One important element of the theoretical construct about agency presented in this paper refers to one's ability to move both within, and outside of, a certain field (e.g., public education) to broaden one's possibilities to achieve needed resources to reach certain goals. During the interviews and electronic conversations teachers formulated two main aspects of *RiverWalk Brasil* that seemed to connect with these formulations.

Claudia and other teachers were attracted to the perspective of affiliation, even if only informally, with the foreign university where the project was held. Claudia and other teachers were interested

in crossing the field of K-12 public education to enter the field of higher education—in this case through their participation at the project conducted at a U.S. university. Claudia said that when she first talked about the project to her students, she said "we will investigate rivers … there is a plan like this and that from a university in the United States that is the *RiverWalk*." In an email from late June, Claudia said that she "received this morning a big package [project materials] direct from the U.S. … I don't even have to say that some people [other teachers] were extremely jealous ☺."

Roberta and other teachers saw yet another interesting possibility of field crossing by participation in the project. She was interested in becoming skilled in computer technology applications. Before she was invited to join the project she "had already mentioned [to the school administration] a desire to work in the computer lab. But I had to learn it since I didn't know how to do it." Participation in the project became an opportunity for her to acquire specific knowledge about technology use. She said that she "only received [external technical] training because of *RiverWalk*." Teachers understood that participation in the project opened up opportunity to access these fields (higher education, computers, media) and then to access resources usually scarce for public school teachers. These resources configure forms of cultural capital (e.g., a U.S. university, computer skills) (Bourdieu, 1986).

Bourdieu elaborated that:

> *"the appropriation of cultural products … functioning as cultural capital … yield a profit in distinction, proportionate to the rarity of the means required to appropriate them, and a profit in legitimacy, the profit par excellence, which consists in the fact of being (what one is), being what is right to be" (1984, p. 228).*

Organized Improvisation and Access to Resources

Teachers understood that in order to fulfill their role as participants in the project they would have to stretch their teaching repertoire and they would have to seek still other resources to "empower" themselves. They engaged in "organized improvisations" given the tensions between specific kinds of demands embedded in the activities proposed by the web-based learning project and the lack of structure and experience faced in these schools. Teachers accessed "material" and "non-material" resources that allowed them to move ahead toward their goals within the learning project.

In an email from the beginning of June, Roberta complained about the lack of traditional sources of information and expressed her concerns. "We [Roberta, other teachers on her team and students] have found great difficulty in gathering information about the river … Even though students visited eight different institutions to collect information we haven't moved very far ahead." That seemed to be a difficult challenge for them given the lack of official sources of information. She wrote that "we thought about giving up … After intense discussion we decided to look for other sources of information … It took us a while to realize that the people living near the river could be of great help", Roberta said. A similar experience occurred in other schools and soon teachers shared their struggle to find resources and also their ways to face it by exchanging emails among them. Almost all schools have presented pictures of people who live near the rivers and their testimonials. This experience characterized an initiative to access local "funds of knowledge" (Moll, Amanti, Neff, & Gonzalez, 1992).

Teachers also had to deal with the lack of money and basic infrastructure to organize field trips. They insisted on doing the field trips so that students could take a "real" look at the "problems involving the river and the community where they live" according to Maria. To make it happen some teachers produced and sold T-shirts to raise money while others used their personal

connections in the state and city departments of education to request a bus to transport the class to the riverbed. Carol reported that they "wanted everybody to be able to participate in the online chats but we had only one computer. We did not even have a projector. One of us read aloud everything that appeared at the computer screen and we would tell the one in charge of the keyboard [students rotated this position] what to say in response". These events portray how teachers have improvised and acted to access human and non-human resources in need to achieve project's goals in their teaching. They engaged in "organized improvisation" to access material and non-material resources not available in the field of public education in Brazil.

Teachers Transpose Schemas

The move to go outside the school to access scarcely available computer technology resources once again ended up becoming a very meaningful opportunity for some teachers to transpose schemas. It was a new experience for them, given that most of their teaching experience had been restricted to the school boundaries. Later on in the project Claudia (whose school did not yet have an established Internet connection at that point) told her students that they should find a way to participate in the upcoming online chat with other participant schools. Claudia said she paid close attention to the ongoing online interaction from moment to moment while she exchanged messages with her students. Instead of standing in front of the class to give her lecture, Claudia sat down in front of a computer on a remote location. Online teaching was new for Claudia. She addressed students' questions by reflecting that "the worst problems about the destruction of the river are related to human action." During this chat Claudia also exchanged ideas with students from other schools.

This event constituted a new experience for Claudia in two ways. She used her experience as a teacher gained by teaching inside a traditional classroom to manage her teaching as she participated in the web-environment. At that point, Claudia transposed her schemas (cognitive patterns, embodied practices, principles of action) about how to be a good teacher in this new way of teaching — sitting alone in front of a computer screen at a nearby library to participate at short lessons with students she had never met. Claudia selectively recognized schemas (it was a teaching space, but not a traditional one), located them (it was possible to use some traditional teaching techniques even in this unconventional setting) and implemented them (she asked questions and clarified concepts) in an ongoing transaction (during the web-interaction when concepts have been discussed between teacher and students).

Claudia's transposition of schemas took place in tension with the public school structure given the current understanding that only teachers who have received extensive professional training would "succeed" to teach a lesson in a web-environment, which was not her case. This episode is also representative of what Bourdieu (1992) has referred to as tensions leading to transformations in the course of actions and Wacquant (1992) has identified as "political undone." Instead of adopting a passive attitude and accepting the many limitations, teachers transformed problems into opportunities to learn and therefore to become better teachers.

Embedded Agency

Teachers' "structurally embedded agency" described along this section developed into an array of new actions. Teachers were not limited by the structure of public schooling. Instead, they explored the tensions in the structure (within and across fields) and they accessed needed resources (both material and non-material). On certain occasions, teachers faced the lack of resources by developing "organized improvisation." Teachers did that by transferring schemas (based on previous knowledge) to solve new difficulties. In overcoming an initial lack of resources needed and desired to enact the learning project, teachers challenged the idea of public schools

as a site where failure is the norm. This indicates that teachers' agency within the learning project "reconfigured" (Sewell, 1992) the structure of certain public schools in Brazil.

At the end of the school year the participant teachers and students published their web page at the project's web interface. The project became news in many local newspapers and at TV stations. Two schools received a small grant from the state government that would support students to work more closely with the project in the following school year. One teacher applied for a master's degree since she was interested in reflecting further about her experience in the project. Two teachers from different cities in the same state organized a meeting among participating teachers and shared conversations held during the meeting with other teachers by email.

Claudia's school received a Science Awards hosted by the UNESCO (in partnership with the Ministry of Education). Teachers also talked about the direct impact of the project on students. "It restored students' self esteem," said Maria. "After *RiverWalk Brasil* students have asked for more projects like this. They want to use the computer lab and they know it is possible to do something because I did something even though I didn't know anything about computers," added Roberta.

CONCLUSION

The study demonstrates that the scarcity of computer technologies at public schools and the lack of teachers' experiences with web-based learning projects did not constitute a barrier to implementation. Teachers' agency manifested by fields crossing and the transposition of schemas to achieve needed resources. This allowed the achievement of the *RiverWalk Brasil* project goals and practices. This demonstrates that the initiative of reform projects and the availability of computer technologies at school – even if precarious and limited – creates possibilities for new teaching and learning experiences.

The mismatch between the original characteristics of the learning project developed in the U.S. and the situation of public schooling in Brazil originated a gap that had to be bridged by the participant teachers. This resulted from demands posed by the project focused on the "developed nations" schools and certain conditions of "Third World" public schools. In many cases, such gap has been bridged by new interventions and programs (grants, professional training, and new equipment) to allow the achievement of proposed goals or it has led to failure (teachers end participation, students loose interest, the project disintegrates). Such was not the case of the experiences analyzed in this paper.

The *RiverWalk Brasil* experience reveals the presence of new elements and the participation of teachers aiming to explore the fissures in the structure of a complex field to achieve certain aims. This perspective problematizes the assumption informing previous studies and policy that subordinates the extensive availability of computer technologies and teacher professional development in the area as *sine qua non* elements for the success of similar "modernizing" initiatives of school reform. This paper has shown why and how teachers operated inside and outside of the field of public education, they improvised and they accessed resources necessary to bridge that gap. Teachers' actions seem to be in line with Bourdieu's formulation that:

> *"between conditions of existence and practices or representations there intervenes the structuring activity of the agents, who, far from reacting mechanically to mechanical stimulation, respond to the innovations or threats of a world whose meaning they have helped to produce" (1984, p. 467).*

Some teachers could not conclude all of the activities proposed by the project since a few schools lost their Internet connection service during the project. One teacher left the project apparently given the extremely precarious situation of the computer machines in her school. These experiences indicate barriers posed by the field of public education that, however, did not obstruct most teachers and students from enacting the project. As identified in studies conducted in Egypt (Megahed & Ginsburg, 2004) and Argentina (Birgin, 2000), teachers often develop contrasting solutions for problems targeted by reforms in education, because and despite of local barriers and challenges.

This research project also faced limitations. Teachers' actions to bridge the gap produced by the lack of resources constituted a very positive initiative, but it may have been an extraordinary occurrence within the enduring and challenging public school routine in Brazil. Future case studies conducted with teachers who have been using computers for many years may be able to demonstrate if and how the novelty aspect of the project may have played a key role among teachers' dispositions to overcome the multiple challenges. Future studies may reveal what happens once the novelty effect fades away. This seems to be in line with Grace's proposition that "schools … are both arenas of change and repositories of continuity" (1978, p. 51).

The fact that teachers developed ways to overcome so many adversities does not mean that the Brazilian federal government (and also the state and local governments) should feel less obligated to fulfill its responsibilities as the main provider of good and sound public education (sustained by realistic and effective policy and programs). Instead, the case portrayed in this paper provides an example of the wide new possibilities posed for public education – given teachers' agency – once basic requirements are fulfilled by the government and the civil society.

ENDNOTES

1 Various programs have been launched by the Federal Government to deploy computers and give training to some public schools in Brazil since the 1990s (MEC, 1997; Moraes, 1997).

2 While these are policies crafted at the federal government level, it is important not to homogenize the Brazilian context given the strong regional differences in the country. Also, a number of educational policies are decided at the state and local levels.

3 For example, in 2001, there were 53,895 computers installed for a universe of 200,000 public schools in Brazil. Only 700 public schools had Internet available (MEC, 2002). That means that only 0.35% of the schools had Internet access.

4 The school year in Brazil runs from late February to December with a one-month vacation in July.

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