Conscientization of a Computer Curriculum:
A Case Study of Community Computing Model in Bangalore, India

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Introduction

Paulo Freire (1998) posited that the road is made by walking on it. Encapsulated in this belief is the notion of constructivism, that people give meaning and purpose to things. Yet, Freire’s work was more than just about constructing meaning; his work centered on liberation through critical consciousness. Freire termed such critical consciousness as conscientization or conscientizao, which he describes as knowledge “that emerges only through invention and re-invention, through restless, impatient, continuing, hopeful inquiry that human beings pursue in the world, with the world, and with each other” (FREIRE, 1970, p. 58). In the current Digital and Information Age, information technology and computer provide a tremendous amount of knowledge. With just the click of the mouse, a person can video chat with another person living halfway around the world, explore stars and constellations, or just keep up-to-date about the futbol scores in Brazil. Computer technology, via the Internet, provides access to the pursuit of knowledge, but how can it be used for a hopeful inquiry? Indeed, what are the ways that people can use technological tools to also foster critical consciousness? This article takes up these questions.

The article’s purpose is to describe and report on a case study of a community computer center, called the Ramji Center, which is located in one of the largest slums in Bangalore, India. The study uses Freire’s notion of conscientizao to investigate how this model empowers elementary school children living in the slum through a comprehensive curriculum, which includes computer skills. Through a case study research design in the ethnographic tradition, the paper tells the story of the Ramji Center and examines the center’s educators “grass-roots” efforts to transform their community by using computer technology. The article will explain the center’s curriculum and will examine how the center’s elementary students learn about computer technology as well as use the computer as a way to transform their identity. The article will also describe and analyze the participants’ (the center’s educators and students) perceptions of computer technology. Finally, the article will examine the Ramji Center utilizes their computer science curriculum a way to develop a critical consciousness and emancipatory education for the children.

Background and Framework

India’s policymakers assert that information and communication technology (ICT) has promising educational benefits and provides innovative ways to educate India’s elementary schoolchildren. However, many of India’s children do not have access to even a single computer in their schools (PAL, 2009). The literature on international development is mixed when it comes to the affordances of computer technology. Some policymakers identify
ICT as a key to sustainability and economic growth (JHURREEV, 2005). Others are skeptical of ICT’s sustainability (PAL, 2009) and are warn of “Matthew Effect” where the rich become richer and the poor, poorer because of computer technology. Kenny (2003) warns against any perception of computer technology for development as a technology “quick-fix” for solving centuries old development problems. Whereas, Pal (2009) cautions that investment in ICT often leads to international donors choosing to neglect developmental causes like sustainable farming. The skepticism and concern reflects the limited knowledge of how computer technology correlates to the achievement of a developing country’s social and economic goals. The knowledge gap also reflects the general lack of education research in developing nations like India (JAYAPALAN, 2005; PAL, 2009; WALSHAM, 2010). So while policymakers expect ICT to usher in promising education changes, they have a limited understanding of how that technology is negotiated in elementary school classrooms.

At the local school level in India, and other developing countries, there is a lack of research about the meanings Indian teachers and students assign to computer technology (WALSHAM, 2010). Researchers have yet to analyze the differences in Indian teachers’ and students’ interpretations regarding ICT’s educational purposes (PAL, 2009). Consequently, it is unclear how and why computer technology is negotiated in India’s most basic schooling unit: the elementary school classroom. Identifying and analyzing this discourse addresses the need to develop frames of reference (PAL, 2009) towards a deeper and more collaborative understanding for elementary school computer use.

The Social Construction of Technology (SCOT) Theory is a promising frame of reference for investigating how computer technology gets contextualized in local settings, like elementary schools. SCOT theory provides a framework for investigating how elementary schools use computer technology. Rather than focusing on ICT, SCOT shifts the focus to the uses for ICT. The strength of SCOT theory, though, is that it also offers a methodological approach for examining how people negotiate meaning for technology. SCOT’s four step approach includes: (1) identifying the relevant social groups who share space in a technology’s meaning construction; (2) examining each group’s interpretative flexibility, which is their interpretations for using computer technology; (3) investigating how the social groups negotiate their interpretative differences; and (4) examining each social group’s demographics or “technological frame” in relationship to their interpretations for the computer (BIJKER, 1995). In sum, SCOT maintains that social groups, like students and teachers, construct the meanings and purposes for technology based on their social context and interactions. This article also employs Freire’s (1970) concept of conscientização to
explain how Ramji Center’s meanings and purposes for computer technology use reflected a deeper understanding of the community. As mentioned earlier, Freire connects conscientization to an education which liberates; an education that helps learners to transform who they are and how to change their reality. The article uses Freire’s work in order to analyze and discuss how children were using computer technology as a pathway to liberation and justice.

**Method**

Using the SCOT framework, the study’s research questions are the following: (a) What are the uses for computer technology in the Ramji Center? (b) How and why is computer technology socially constructed in the Ramji Center? To systematically organize these research questions, I utilize a case study research design in the ethnographic tradition (GEERTZ, 1973). According to Yin (2008), case study is a research design for empirical inquiry that allows for the investigation of complex phenomena within in an authentic context. The study’s data were collected between November 2010 and April 2011. The study employed qualitative and quantitative methods to compile a case study of the Ramji Center.

There were four qualitative data sources: field notes from on-site observations, a student focus group interview, educator interviews, and collected artifacts like curriculum documents and digital images. The study’s observation protocol provided focus for field observations. The student focus group interviews and tutor interviews were structured to identify perceptions for using computer technology. Collected artifacts included curriculum documents and digital images as visual data of Ramji Center’s computer hardware and software. Two sources of quantitative data included: a student questionnaire and tutor questionnaire. The questionnaires’ generated demographic data and identified the participants’ perceptions about using computer technology.

I analyzed the qualitative data are examined using a three-step interpretive approach and the constant-comparative method (MILES, 1994). Pattern-matching logic (Yin, 2008) was also utilized to identify patterns in the data that either do or do not match with Freire’s conscientization. I analyzed the quantitative analysis at a descriptive level. These descriptive statistics were intended to provide “snapshots” of participant perceptions of computer technology. The quantitative results were helpful to triangulate findings about the participants’ perceptions of computer use. However, the quantitative data only provided basic descriptive statistics and are not intended to claim causality.

**Participants and Setting**
The study’s sample was drawn from the Ramji Center (a pseudonym), which is a community center in Bangalore. The Ramji Center is an after-school community center located at the end of what some might call a narrow, “back alley” of a slum. Three story tenements tower above the alley. The tenements are densely populated with families. The alley serves as a kitchen, latrine, washroom, and the communal laundry area. The center is located in a one-story building that serves as both a computer center and a communal area for the slum. The building is one large room about 8 meters long by 3 meters wide. The walls are a two toned color with canary yellow on top and baby blue on the bottom. The cement floor is painted auburn colored and is dusty. The room has four large windows that open up to a view of the alley way. A metal locker, a wooden table, four chairs, and a book shelf make up the room’s furniture. A framed portrait of Dr. B.R. Ambedkar hangs on the main wall. Inscribed below the picture are these words, “Father of India’s Constitution.” One of the rules of the center is to remove shoes before entering; yet, many students arrive barefoot and explain they prefer to walk around the slum neighborhood that way. The Ramji Center has a desktop computer and three laptop computers, which students take turns using, teacher has a rotation schedule so that all the children who attend get about 15 minutes on the computer. Students primarily play computer games or go to a computer art program called Tux Paint. Students who are waiting for their turn on the computer receive tutoring for their school homework. The last part of each lesson is dedicated for singing and dancing. Most of the songs that the students sing are social-justice oriented and in the Tamilian language.

The Ramji Center holds classes for elementary aged slum children on weekend evenings for two hours at time. About 20 children regularly attend, of which 80% are girls (the students are between 8 years old and 12 years old). The study’s child participant sample is 13 elementary aged kids, who are at the fifth grade age range (10 and 11 years old). The children’s parents are mostly day laborers and house servants. Many of the parents are Tamilians, who migrated to Bangalore from Tamil-Nadu, the Indian state that neighbors Karnataka. They move to Bangalore looking for jobs and economic opportunity, but find that the housing market is unaffordable. Thus, many cannot afford to live in an apartment on their meager wages from daily work, so they end up renting in the slums. Most of the children in this study reported that they live in one room flat, sometimes with another family. Their families use firewood or burn garbage to cook their food in the slum’s alleyway. None of the children’s families owned a car. Instead, most the children reported that their family had a bicycle that was used for transportation. Additionally, all the study’s children reported that their families owned a television and a cell phone. The average amount of books in the place
they lived was seven. Finally, more than 75% of the study’s children shared that they wanted to become software engineers in the future.

Additionally, the participant sample also included 5 educators who provide computer education tutoring for the children.

Findings

Three themes emerged from the data analyses. The themes shed light on ways that computer technology is social constructed at the Ramji Center. First, the analyses revealed that the emphasis on computer technology skills is part of the Ramji Center’s larger vision about liberation and social justice. Second, computer games and creative applications sparked the students’ initial interests in the Ramji Center, but singing and dancing made the children return. Third, the Ramji Center participants assigned emancipatory meanings and purposes to computer technology. In sum, these themes help to answer the study’s two research questions. In the rest of this section, I will examine each theme in greater detail.

Theme 1: A vision for social justice.

Again, the first study’s first theme finds that the Ramji Center’s emphasis on computer technology skills is part of the center’s vision about liberation and social justice. In order to understand this vision, I start with the story of how the center began. The story starts with the children from the slum, a social activist, and software engineers. The children explained that they were upset that they were not allowed to use computer technology at the government-run, public schools that they attended. They wanted to learn how to use computer technology and asked a local social activist in the community, who I will refer to as by the pseudonym, Ms. Lakshmi, if someone could help set up a computer center in a small space that was not being used by the community. Ms. Lakshmi liked the idea and discussed the children’s suggestions with some software engineers who worked in the big office buildings that overshadowed the slum where the Ramji Center is located. The software engineers agreed to volunteer their time to help set up the center. Ms. Lakshmi found some people to donate a couple used laptops and desktop computers and the Ramji Community Computing Center commenced.

The Ramji Center was founded on a unique model called community computing. The community computing model seeks to empower local community through ownership of computers and computer education by using free software. The Ramji Center has a three prong mission for community computing: 1) Create self-sustained and employable young people who have excellent computer skills, 2) Enable upward social mobility to slum children
by providing computer skills and educational support, and 3) Create agents of change in the local community who can be catalysts for social transformation.

According to the educator participants, the Ramji Center implements this mission in a two unique ways. First, the mission is implemented through a cycle of “pass it on” education. Pass it on education simply means that the volunteers from the local software companies first worked with the teenagers in the Ramji Center to teach them basic computer literacy skills. Once these teenagers, who are all from the same slum, learned some basic computer skills they became the teachers for the younger children who also lived in the slum. Consequently, the five educators in this study are all “passing on” their computer education to the children in their community. Since the study’s educators are all in their late teens, none were formally trained as teachers. Second, the Ramji Center mission is implemented using free, “open source” GNU/Linux software. The course instruction includes “hands on” computer skill training that revolves around the free software movement. According to the Free Software Foundation website, “free software is a matter of liberty, which allows users to have the freedom to run, copy, distribute, study, change and improve software.” The use of free software reflects the Ramji Center’s larger commitment to the mission of liberation and social transformation. Free software allows the students to have equitable access and investigate how software is developed, as well as, how software can be adapted and changed. Free software allows this kind of exploration. A student created poster at the Ramji Center puts it like this, “Free software is the future. The future is ours.” This poster captures the larger Ramji Center vision that is oriented around liberation and social justice.

**Theme 2: Integration of computer games and performing arts.**

The second theme that emerged from the data analyzes was that while the computer games and creative applications sparked the students’ initial interests in the Ramji Center singing and dancing made the children return. The educators at Ramji Center are committed to a holistic curriculum for the children. The curriculum includes playing computer games, learning software applications as well as a focus on the arts. In my field observations at Ramji Center, I observed the children playing games on the laptops. The favorite games were chess, a racing car game, and a free software Cricket type game. The children also enjoyed using the OpenOffice Impress program to create projects that reflected the Ramji Center’s mission of having the children become future change agents in their community. For example, one such project was a poster design. For this project, the children created a poster that explained a social problem with both images and words (in English and in the Tamilian script, which is the mother tongue language of many children living in the slum).
The children created posters that included topics like: child labor, air and noise pollution, the danger of firecrackers, and women’s rights. The poster’s purpose was to raise awareness of community and social issues. Such a project fits with the center’s goal of promoting social justice through computer use.

The Ramji Center curriculum focuses on game playing and poster design as ways to help motivate children to attend each weekend. As one of the educators explained, “The children are motivated to play games and make things with the computer and these things help build their confidence with the computer’s keyboard.” Another Ramji Center educator posited that such motivation would most likely increase the chances that the children will continue to consistently attend Ramji Center. The educators also explained that the Ramji Center children grow older; more advanced computer skills would be introduced. Yet, the educators were especially attuned to the importance of keeping children motivated to return each weekend to the Ramji Center. They found that the arts, especially singing and dancing, were strong motivational components to the Ramji Center curriculum. Indeed, during all my field visits to Ramji Center, I observed the children singing a mix of Bollywood hits and social justice related songs, including *We Shall Overcome*. The children would often sing for the final 20 minutes of each weekend session. The singing, especially if it was a Bollywood song, would also include an impromptu Bollywood dance session that all the children, and the educators, would participate and enjoy. In my focus group interview, one of the children explained that, “The computer games are what bring me here and the singing and dancing keeps me coming back.”

**Theme 3: Computer technology as emancipation.**

The third theme to emerge from this study was centered on how the Ramji Center participants assigned emancipatory meanings and purposes to computer technology. Prior to the study, I had the opportunity to interview and chat with one of the software engineers who volunteered to help get the Ramji Center started. During our interview, I was surprised to find that the software engineer, who was trained in the computer sciences, was quite familiar with many education theorists, including John Dewey and Paulo Freire. When I asked the volunteer about the impetus for volunteering and helping to start the Ramji Center in the slum, the volunteer stated, “I think of what Paulo Freire said about education without social action is no education at all. So we are guiding students in learning computer skills that will empower them to make their community better.”

Indeed, throughout my interviews and data collection with the study’s participants, words like empowerment, empower, community, and improvement were oft repeated. For
example, when I asked one of the Ramji Center educators why computer education was important for the center’s children, here was the response, “The computer is a better way to learn more without a teacher. I want the children to know that the computer is useful in the field of life, they can use the computer to improve their life.”

I followed up on this question by asking, “How so, how does the computer help to improve a child’s life?”

The educator responded by exclaiming, “The world tells the children that this [the slums] is where they belong, but knowing the computer their way out. By knowing how to type in English, make presentations, and work a computer, the children make the community better, too.”

The Ramji Center student participants also agreed with this sentiment. When I asked the children in the student focus group interview if they thought that computer technology would prepare them for the future. All the children enthusiastically agreed that it would. I asked a couple of the children to explain how and why. Here are the responses that they gave: 1) “Sir, yes, sir. Sir, knowing how to use the computer is important for my future. I want to be software engineer, so the computer is something I will use everyday.” 2) “Sir, the computer games help me to learn the keyboard. I have to know the keyboard to continue to use the computer in the future.” 3) “Sir, I am not allowed to touch the computer at my school, but I come here and am so proud to use it. I will continue to use the computer to help make my community better.”

Sadly, this last quote is the reality for many of India’s underprivileged children. In many of India’s government-run, public elementary schools, computer technology is quite scare. And if there is are computer available, many children are not allow to even touch the computers until they are in the seventh or eighth standard (grade level). So, the Ramji Center helps to fill that gap in learning by giving children who live in the slums opportunity to use and interact with computer. Such interaction is emancipatory, as the Ramji Center educators assert that these computer opportunities are ways for the children to learn important skills for future employment and for developing their confidence by having access to computer technology. According to the Ramji Center participants, such access is empowering and liberating as well as a key part of developing technological skills that will help to improve lives with in the community.

Discussion

This article’s thesis is that the Ramji Center provides a compelling educational model of how computer technology is social constructed for critical consciousness or conscientização.
Thus far, I described the meanings and uses for computer technology at the Ramji Center. In this section, I discuss the implications of this research as related to that thesis. One implication of this study is the importance of children and their voices. Ramesh Srinivasan (2006) argues that Paulo Freire conception of *conscientizao* provides an instructive frame of reference when analyzing community focused computer education projects like the Ramji Center. Indeed, Paulo Freire asserts that such projects “must directly engage the voices, categorical notions and discourses directly from the community themselves” (SRINIVASAN, 2006, p. 357). The inception of the Ramji Center is one of the strengths of this model. The fact that the voices of the children in the slums were heard and acted on is an example of how the voices in the community were engaged themselves. In India and in countries around the world, including the United States (my home country) the voices of children are suppressed and silenced. Indeed, it is rare in the literature to find instances where children, especially underprivileged children, have political power or influence; where their voices are truly heard. However, in the case of the Ramji Center, it was the children who helped to get the center started. The educators and leaders at the Ramji Center also recognize that it is the children who will sustain and carry on the center’s mission. That is why there was such an emphasis by the Ramji Center educators on consistent attendance.

This leads to a second implication related to the study, which is the relationship between the Ramji Center mission and the role of computer games and cultural expressions. In the findings section, I explained how computer games provide an incentive for the children to keep returning to the Ramji Center each weekend. So games make are a large part of the scope and sequence of the center’s curriculum. Yet, there is also a bit of a conundrum; the children attend even though there are enough computers for all the children to use. While they are interested in games, the children also expressed frustration during the student focus group interview about the lack of laptops and the fact they have to rotate to use the computers. Thus, resource scarcity, which is another larger theme throughout India’s elementary school system, is also evident at the Ramji Center. The children recognize the value in learning how to use computer technology. Additionally, the children enjoy using the computers, but are frustrated that they do not have even more access to the computer equipment. So, why do they continue to return to the Ramji Center each weekend?

The inclusion of cultural celebrations, like the Bollywood singing and dancing, are just as important incentives to insure regular attendance. The singing and dancing as cultural arts seems to have forged a deep bond among the center’s children with the larger mission of the Ramji Center. In Freire’s powerful book, *Teachers as Cultural Workers*, he discusses the
importance of educators connecting with their learners’ cultural identity by stating, “Educators need to know what happens in the world of children with whom they work. They need to know the universe of their dreams” (FREIRE, 1998, p. 72). Cultural expressions, like songs and dance, are important facets of the child’s universe. Singing and dancing at the Ramji Center are more than just fun activities. Rather they are uninhibited cultural arts that fostered the children “buying in” to the center’s mission as well as the computer skills that they were learning. The singing and dancing gave the children a form of expression for their collective voices. Their songs about empowerment, overcoming, and solidarity were both denunciations and annunciations (FREIRE, 1994). In one breath, the children denounced the injustices and miseries in their lives, while with another breath, they announced their humanity and the possibility that their future will be different. Like Freire (2004) posits, denunciations and annunciations are necessary parts of building awareness and consciousness in pursuit of the hope for a better world. Curiously, in many Western societies, including the United States, the cultural arts within the context of schooling are often dismissed as being too emotional and non-intellectual. At the same time, denunciations and annunciations also get neglected for the status quo. This study suggests that educators, even those who teach about computer technology, do a disservice to their learners when they sever the arts from critical consciousness.

The study’s third implication examines Freire’s (1994) notion about social transformation through “rewriting the world” in relationship to the uses for computer technology. One of the affordances of computer technology is that it is a malleable tool that gets used for many purposes. Indeed, this is good news to marginalized communities, like the children who live in slum where the Ramji Center is situated. Srinivasan (2006) posits that one of the biggest benefits of computer technology is that it allows for the creation of content and media. Computer technology is powerful because it can be shaped, changed, and re-purposed. While the Ramji Center educators shared idealized and somewhat uncomplicated perceptions of the benefits of computer technology use, their commitment to the “free software” movement suggests a deeper understanding of the value computer technology.

The Ramji Center educators understand the possibilities of computer technology and software. Indeed, computer technology has an emancipatory quality to it; it can be used to disrupt, intervene, and question the existing powers structures. For example, when the educators had the children create their poster projects about social issues, there was also the expectation that the children would hang their posters in the community in order to raise
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awareness. Such acts reveal the connection between computer technology and conscientização, which is marked by developing “critical understanding of technology that is infused with the growing capacity for intervention in the world” (FREIRE, 2004, p. 85). While computer technology often gets used in consumptive and oppressive ways; these ways do not define computer technology. People give meaning and purpose to technology. At Ramji Center, computer technology’s purpose is about fostering a deeper conscientização of the world. Such purpose is much closer to a “correct understanding of technology, which is not diabolical understanding that threatens human beings, but, rather, the understanding that technology is in constant service to the well-being of human beings” (FREIRE, 2004, p. 85). The Ramji Center provides an example of how one group of committed educators are using computer technology in service to a critical and emancipatory education for the betterment of their community.

Conclusion

In sum, Ramji Center is a unique model in how it has embraced a Freirean approach to computer education and conscientização. The model struggles with scarcity of resources and other issues that are common to India’s vast educational system. It is a computer education that has legs as there are now additional community computing centers in Bangalore’s slums that have been established and are utilizing the Ramji Center curriculum and pedagogy. In order to examine the effectiveness of these start-ups, more research is needed. Furthermore, more empirical studies, outside the Bangalore, India, context, will likely provide stronger findings that are both international and comparative in scale. Finally, more theoretical studies will help to investigate the contours of the relationship among computer technology, critical consciousness, and an emancipatory education. Such research will move the field closer to one of Freire’s deeply held beliefs that, “Regardless of what society we are in, or what world we find ourselves, it is impermissible to truly teach people without a consciousness of our own selves as historical, political, social, and cultural beings within a society” (As paraphrased from FREIRE, 1994, p. 116). Freire believed that such conscientização was not possible when coupled with the purely technical part of computer technology. However, like the Ramji Center shows, conscientização via computer technology provides liberating possibilities when the computer technology is used as part of larger mission that is oriented towards social justice.
References


