Canadian Journal of Learning and Technology
Volume 33(2) Spring / printemps 2007

Adult instructors' perceptions on ICT and diffusion practices: implications for equity of access

Bertha Salinas-Amescua

Author

Bertha Salinas-Amescua is with the Universidad de las Américas, Puebla, Mexico. Correspondence regarding this article can be e-mailed to:bertha.salinas@udlap.mx

Abstract: This study suggests equity of access goes beyond technological availability. Based on a larger exploratory study of the initial implementation stage of the Mexican government's community technology centers, CTCs ("plazas comunitarias"), adult education instructors' perceptions and diffusion practices are described as a mediating factor to understand non-access of poor adults. The theoretical perspective integrates concepts from innovation diffusion studies, while questioning the limitations of this theory in terms of understanding instructors' practices. Thus, the relation between human agency and structure, from Giddens' Theory of Structuration, is incorporated. Qualitative data from 16 CTCs are interpreted inductively. It is concluded that CTCs were a top-down innovation; instructors perceived and diffused CTCs in very different ways, thus limiting equity of access. These social practices stem from social actors' routines, which institutionalized courses of action; understanding them could illuminate the complexity of the diffusion process, generally depicted in linear form.

Résumé : La présente étude laisse entendre que l'équité d'accès va au delà de la disponibilité technologique. Établie sur une étude préliminaire plus large de la première étape de mise en œuvre des centres communautaires de technologie du gouvernement mexicain, les CCT (« plazas comunitarias »), les perceptions des instructeurs dans le domaine de l'enseignement aux adultes et les pratiques de diffusion sont décrites comme un facteur médiateur permettant de comprendre pourquoi les adultes pauvres ne peuvent y avoir accès. La perspective théorique intègre des concepts provenant d'études sur la diffusion de l'innovation tout en questionnant les limites de cette théorie en ce qui concerne la compréhension des pratiques des instructeurs. Ainsi, la relation entre l'agence et la structure humaine, de la théorie de structuration de Giddens, est intégrée. Les données qualitatives de 16 CCT sont interprétées de façon inductive. On a conclu que les CCT sont une innovation descendante; les instructeurs ont perçu et annoncé les CCT de façon très différente, limitant ainsi l'équité d'accès. Ces pratiques sociales proviennent des routines des

participants, elles ont institutionnalisé la ligne de conduite; les comprendre pourrait éclairer la complexité du processus de diffusion, généralement illustré en format linéaire.

Introduction

Thousands of adults throughout the world lack access to information and communication technologies (ICT), despite well-funded initiatives to provide them free of charge. This problem occurs in countries such as Mexico, Canada, the United States and Great Britain (Cisneros, 2005; Clarke, 2005; Kotrlik & Redmann, 2005). Adult education (AE) has attempted to contribute to an e-inclusive society by prioritizing equipment and network investment, the creation of community technology centers (CTCs), and instructor training. This study aims to extend the concept of equity of access beyond technological availability by emphasizing the fact that it is a complex phenomenon mediated by personal, socio-cultural and institutional factors, which facilitate or limit ICT access for the poor.

Studies on AE technological access and inclusion have focused on different aspects. Hopey (1999) analyzed expectations generated in AE stakeholders and concluded that the challenges "have less to do with the quantity and availability of technology than with the quality and effectiveness of technology use" (p. 2). He suggested that successful integration of ICT into AE depends on five implementation points: planning, training, leadership, technical support and resources. Another study points to several issues affecting adult learner ICT access in literacy programs: funding, access, lack of expertise and time (Jafee, 2001). In order to promote an e-inclusive society, changes in training strategies are suggested. Rather than teaching technological skills in an out-of-life context, technology must relate to adults' needs and interests, providing uses relevant to their lives (Clarke, 2005). In England, it has been proven that adult access to technology is efficient and natural when done through informal learning (Selwyn & Gorard, 2004).

Servon and Nelson (2001) studied CTCs as the sole option to bridge the digital divide, providing a typology of these community technology centers. They concluded that CTCs contribute to bridging the information gap by providing underserved inner-city communities with ICT access, training, and ways to create their own content. However, they warn researchers and policymakers not to view ICT as a quick fix for urban problems. The study warns of the limitations of ICT access to resolve social issues, while defining access as the availability of computers, not the ability to use them. Other authors clearly distinguish between ICT availability, access and use, and show that socio-economic status bears an influence. Low-status high schools, even with identical equipment, are affected by the lack of human support networks, irregular home access to computers, and pressure to raise school test scores (Warschauer, Knobel & Stone, 2004).

These AE studies stress the importance of broadening ICT availability, training instructors, linking use to adults' needs, achieving effectiveness in technology use, and teaching through informal learning. However, they assume learners are already interested in using ICT or are enrolled in a center or school. In order to better understand equity of access,

research is needed regarding adults who do not approach ICT even when made available, and we need to analyze determining factors.

In Mexico, the federal government implemented a massive program of community technology centers[1] in poor areas of the country as part of the national AE system, from 2001 to 2005. Some questions which arose are: Did the target population really have access to technology? Did the first stage of implementation seek an e-inclusive society (Clarke, 2005)? In the first year of the program's implementation, our research team carried out an exploratory study. We found that: a) poor adults were not using ICT; b) AE instructors had different perceptions of ICT and CTCs; and c) diffusion strategies did not attract adults. This article builds upon the findings in terms of their relevance to equity of access and seeks to provide an inductive theoretical explanation. The goal is not to verify a hypothesis, as in deductive hypothetical research.

The purpose of this article is to describe adult instructors' perceptions of ICT and their diffusion practices, as a means of understanding non-access of poor adults at the technology introduction stage in Mexican adult education. Using field data, we will attempt to answer the following questions:

1. What kinds of people are using the ICT available free of charge for the first time in CTCs?
2. Does the knowledge instructors have of ICT allow them to visualize significant uses of ICT in adults' lives? Do they have specific strategies to bring technology closer to the needs of poor communities?
3. How do adult learner instructors perceive new CTCs, and what diffusion practices do they use?

Equity of access, innovation and social practices

This section presents a conceptual framework integrating various foci: the term "equity" is questioned, and linked to concepts of the innovation diffusion studies and Social Action theories. These perspectives are based on the following argument: it is assumed that equity of access goes beyond technological availability and that one of the institutional factors that limit adult ICT access is diffusion strategy, mediated by AE instructors' social practices.

Concepts from diffusion studies are covered, such as the knowledge stage of innovation-decision and the ability to anticipate consequences; they are situated in a different context from that of Rogers' theory (1983). In order to understand what instructors do, we incorporate the notion of "social practices" and the relation between human agency and structure, based on Giddens' Theory of Structuration (1984).

The distinction between availability and access

AE programs introduce ICT with the goal of improving learning, broadening educational coverage, and favouring the digital inclusion of certain population groups. Access to technology in unequal social contexts is limited by subjective and objective factors. The most widely studied subjective factors are self-perceptions, including self-efficacy; objective factors, are external, including poverty; low educational attainment, the lack of computers and Internet. Governments have focused on investing in equipment in order to

offer ICT to the whole of the population by way of access centers, public libraries and adult education facilities (McCook, 2002; Proenza, Bastidas & Montero, 2001).

In literature, the concept of access is generally linked to the opportunity to acquire or use technological devices (Jafee, 2001). However, having technology does not guarantee equity of access; as Kalman (2004) points out, availability and access have been used as synonyms and should be differentiated. Availability refers to the free provision of technology, materials and training, while access refers to the opportunities and facilitators which allow people to effectively use ICT in a way significant to their lives. Intentionally encouraging equity of access means recognizing that basic social inequities exist among adults. It is necessary to identify the obstacles which keep people from approaching and benefiting from technology, and implement purposeful strategies to balance opportunities. Institutions cannot resolve structural economic inequalities, but they do have the power to inform and motivate in order to demonstrate the usefulness of ICT in poor adults' lives. Thereby, self-efficacy, motivation and diffusion of meaningful information are mediating factors of equity of access in which institutions may participate positively (Salinas, Porras, Huerta & López, 2004; Servon & Nelson, 2001).

A policy favouring equity would have to be implemented from the first stage of innovational introduction. Diffusion studies have pointed to the importance of equity, especially in the final stage, that is, in the consequences of innovations once they have been adopted. The findings of this school of thought coincide in that one of innovation's consequences is the widening of socio-economic gaps in the target audience (Rogers, 1983).

The application of innovation diffusion theory in developing countries has been criticized because it is inadequate to contexts in which social structures are unequal. Therefore, the issue of inequity in innovation diffusion theory is discussed from the macro-social viewpoint, and a shift is proposed from the dominant developmental paradigm to an alternative one, whose objectives are equity of distribution, improving quality of life, emphasis on appropriate technology, and development at the local level (Rogers, 1983).

Instructors' knowledge and perception of innovation: a factor in equity?

In the alternative development paradigm, it is assumed that it is possible to encourage equity using appropriate diffusion strategies, even if the social structure remains unchanged. However, diffusion scholars maintain, at the micro level, the same linear view, in which the adoption decision process follows sequential steps: knowledge, persuasion, decision, implementation and confirmation. This view does not consider the existence of mediating equity factors, which weigh heavily in countries where there is profound social inequality.

The decision-making process is located at the innovation recipient level; it is the "process through which an individual passes from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject" (Rogers, 1983, p. 163). Nonetheless, when AE instructors must diffuse ICT by way of a top-down, centralized

decision, they are not decision makers, but rather a key filter for the information broadcast to the adult population. Therefore, the first stage, "the knowledge stage," is relevant to this study. Knowledge begins when the individual "is exposed to the innovation's existence and gains some understanding of how it functions" (p. 164). Different types of knowledge are identified, including awareness knowledge, which allows us to know what innovation consists of and which need it resolves, motivating the individual to obtain how-to and principles knowledge. However, in practice, knowledge of an innovation is more complex, because before understanding, "what is it?", "how does it work?" and "why does it work?" people create a vague concept or perception which draws significance from daily existence.

Knowledge or perception can also be linked to the capacity to anticipate consequences, that is, the capacity to visualize ICT usefulness in terms of responding to poor adults' needs. Rogers writes of the consequences of innovation as the result of a change when it was accepted or rejected. The consequences are classified in three categories, one of which is anticipated vs. unanticipated. A study of Internet adoption in ALBE classrooms concluded that the consequences perceived by instructors were positive, but they were unable to anticipate them. This is explained by the fact that they expected other desirable outcomes, or that they could understand how Internet would change the dynamics of their classes (Berg, 2005). These results allow us to assume that the capacity to anticipate consequences is relevant in the initial diffusion phase, because it shows the knowledge AE instructors have of ICT.

Knowledge involves an individual's rationality, while innovation within institutions implicates social actors who for the most part carry out tasks. That is, they act without possessing final knowledge. Therefore, what is the place of the interaction between human agency and structure in the diffusion process?

The importance of agents' daily practice, in accordance with Theory of Structuration

Assuming AE instructors' perceptions of ICTs stem from current practice, it would be useful to briefly present some concepts from Giddens' social structuring theory which are relevant to this study. Of course, it is risky to extract ideas from such a broad and complex theory, but it is worth taking the risk, because educational technology research must broaden its traditional frameworks and enrich them with sociological perspectives.

One distinctive element of structuring theory is the integration of action and structure, in which neither one determines the other. They are in dialectic interaction and cannot be viewed separately. We are interested in highlighting the weight of the practice carried out by social agents, which in this article are AE instructors. Social practices are Giddens' starting point; these activities are continually recreated by the agents. Neither conscience nor structure creates activities, but rather the agents, who implicate themselves in practice, produce conscience and reproduce the structure (Ritzer, 2002). "This means that there is a social structure—traditions, institutions, moral codes, and established ways of doing things—, but it also means that these can be changed when people start to ignore

them, replace them, or reproduce them differently" (Gauntlett, 2002, p. 2).

Human agency is displayed in social practices. In fact, actors modify the production of results, albeit unconsciously. Giddens attributes a great deal of power to actors to transform society, and although he admits they face restrictions, he affirms that they can choose, since action implicates the capacity to change situations (Cohen, 2001). He thus distances himself from positions which grant greater importance to the subjective nature of intention, like phenomenology, or to the external structure which determines the actor, like functionalism.

Another point of interest for this article is Giddens' emphasis on practice and daily routine. For example, his concept of social institutions refers to the routine practices of most of their members (Cohen, 2001). Agents control their thoughts, activities and contexts, allowing them to develop routines which train them to efficiently manage social life. This is linked to the distinction made between discursive and practical conscience. The former is that which may be expressed in words by clearly verbalizing ideas; practical conscience is what is done in practice, without the need to express it. The latter is crucial to structuring theory, in which what is done is more important than what is said (Ritzer, 2002). Routine and day-to-day activities are central components of institutional practices:

> Thus, in their daily lives people produce and reproduce the institutionalized practices of their society. Of key importance here is the idea of routine, since this makes up the bulk of day-to-day activity. It is in this day-to-day activity that what Giddens calls the 'duality of structure' is realized. (Shennan, 1989, p. 332.)

The structure does not exist *per se,* but rather by way of human actors' activities. Structure is not defined as structuring properties—standards and resources—which allow for the existence of similar social practices through time and space. Structures manifest themselves within social systems, which are at once a means and a product of recurring social practice (Giddens, 1984, in Ritzer, 2002). Therefore, structure and action are interdependent.

Giddens' "theory of practice" allows for the conceptualization of change: "Furthermore, by its move towards the dissolution of the distinction between 'rules' or 'norms' on the one hand and 'behaviour' on the other, it provides a framework within which change can be conceptualized" (Shennan, 1989, p. 333).

The reviewed literature on digital inclusion focused on levels of technology provision, significant use, or AE instructors' training strategies. Generally speaking, ongoing programs have been studied in order to determine their impact. We found no research which studied institutional factors limiting equity of access in the initial stage of a national campaign to massively introduce ICT into AE.

The context: the Mexican policy of technology for poor adults

The 2000–2006 Mexican federal government[2] embarked on a vast information technology policy through a macro-project called "e-México". The educational sector was also

included, specifically in order to offer ICT access to the poor through Community Learning Centers and "Plazas Comunitarias" (referred to in this paper as CTCs). Operation of the CTCs was entrusted to an existing educational structure, the National Adult Education Institute (INEA), founded in 1982 to provide adult literacy and basic education (ALBE) to youth and adults over age 15.

43.9% of Mexicans over 15 have not completed their compulsory education, amounting to some 30 million people. 8.4% of Mexicans are illiterate, 14.3% have not completed elementary school, and 21.2% have not completed junior high school[3]. This is the potential target population of the new CTCs.

Over the years, the INEA has worked according to the "study circle" and "meeting point" model, in which small groups of adults meet in their homes, in teachers' (or "tutors'") homes, or in spaces lent by churches, municipal offices, social centers, factories, etc. Until now, the ALBE program has not been school-based, and its schedules and spaces have been very flexible in order to adapt to adults' needs. The lack of a school base is also due to the lack of dedicated INEA buildings, a consequence of the meagre financing it receives. In fact, teachers do not receive a fixed salary; they are volunteers with a minimum junior high school education who live in the community[4].

The government's stated goal was to convert the 13,000 INEA meeting points into CTCs during the 2000–2006 presidential term[5]. At the time this study began in March 2002, a total of 200 CTCs were up and running, and in June 2005, there were 1,955[6]. In June 2006, the INEA Executive Director announced he would reach the objective of implementing 4,000 CTCs by the end of 2006[7]. They are set up in the poorest areas, in shantytown suburbs and rural municipalities. Local authorities are required to provide a space, electrical, security and janitorial services. The INEA provides computer and video equipment, a satellite dish, educational materials (printed materials, CD-ROMs and videos) and the new personnel responsible for running the center: a CTC "promoter" (director) and an IT technician. Each center has three spaces: a classroom, a video room, and a computer lab, with 11 linked computers. Services are free and open to the community, so that they may gain access to global human knowledge (CONEVyT, 2001).

Methodology

The INEA faced the challenge of incorporating CTCs into its complex national structure and its innovative curriculum for youth and adults, the Life and Work Education Model (MEVyT). Academic authorities were aware of the fact that an educational proposal to integrate ICT into AE was lacking, even as the implementation of CTCs had already begun. Therefore, our research group was invited[8] to draw up an integration proposal for ICT, not only according to INEA curricula, but also to adults' needs. However, since the innovation was already in place, we needed to carry out this exploratory study in order to get to know the practices and perceptions of people regarding CTCs. This was to be the basis from which to design and subsequently pilot a socio-educational model of the integration of technology

into AE.

The intent was to garner a vision of the people involved in the process, collecting information as it became available using an open-ended qualitative approach to identify real, ongoing processes (the objective dimension) and perceptions (the subjective dimension) of stakeholders, regarding: the CTC, its perceived goal and location; the personnel training; diffusion strategies and messages; learning activities and the role of the different media used; and, users and the ICT-community development relationship.

Sample

At the time of sample selection, about 200 CTCs had been established in 22 of the 31 Mexican states. The sample included six states, whose number of CTCs at the beginning of data collection in July 2002[9] was: Sonora (5), Yucatán (5), Hidalgo (9), Puebla (5), Aguascalientes (11) and Zacatecas (9), an average of 7 per state. A total of 16 CTCs were selected, two or three per state, based on the following criteria:

- States: a diversity of geographic and socio-cultural regions.
- CTCs: fully equipped, opened between December 2001 and February 2002, at least one of them urban (in the state capital) and another in an easily accessible rural location.

Of the 16 CTCs in the sample, six are located in state capitals, four in towns, and six in rural villages. Only two had Internet service at the time of the study, but a few months later all of them had connections. In terms of installations, 5 CTCs had "individual" spaces, converted or built *ex profeso*; the remaining 11 were in spaces belonging to other government agencies: 2 in schools, 2 in public libraries, 1 in an INEA office, and 1 in a community welfare center. Interviews were carried out with stakeholders in the innovation: 18 statewide administrators, and in the CTCs, 16 CTC promoters, 15 IT technicians and 20 adult teachers. Interviews in the target population included 37 INEA-enrolled adults and 20 adults who did not participate in INEA or use the CTCs. We also had informal conversations with leaders or key informers in each state in order to record their perceptions of the usefulness of technology in regional context.

Data collection

A team of five researchers and two assistants participated directly in data collection, observing stakeholders in their everyday context. Each CTC was observed for two days, with an additional day in the INEA state office. Field work was done over a three-month period. A general scheme of participant observation was drawn up, as were individual and group interview guidelines. The unit of study was the CTC, considered to be an internal, open system in interaction with its surroundings. The data were categorized with Ethnograph software using the constant comparison method in order to inductively identify common patterns. The analysis was performed globally on the 16 sampled CTCs.

Results

Who uses the CTCs?

The CTCs were conceived as "a place where youth and adults over age 15 lacking compulsory education can find a wide range of educational content and job training opportunities […offering] an important intercommunication service to Mexican communities that have been isolated from technological progress" (CONEVyT, 2001, p. 43). When interviewees were asked about the CTCs' target population, responses pointed to different sectors; for some: "*The CTC is for low-income residents and those without a formal education*" (7, 50-53)[10]. Another person said, "*Young people come from the public at large*" (11, 49), while for others, the CTC is only for enrolled adults. One person said the CTC "*is of and for the community*" (9, 180-183).

Field observations coincided with statistics periodically compiled by the INEA[11] in a large number of CTCs, that is, the people who use ICT the most are children and teenagers (88%) attending regular schools, along with a few adults enrolled in ALBE. During field work, no adults were observed using ICT. The promoters and technicians informed us that most attendees come from places which are more or less nearby. In a few cases, initiatives to attract adults who lived in rural communities relatively near the CTCs, making transportation easier, were observed. Promoters' first action was to organize free workshops for the at-large population, in which the technician offered computing courses. Participants were mainly youth and children who also go to the CTCs to do homework, since their schools lack technology.

Instructors say youths are more interested in computers (7, 157-162) because adults prefer textbooks (4, 134-136). They uphold the belief that adults are afraid of technology and feel they are incapable of using computers for fear of breaking them. A technician told us:*"Adults are very afraid to use the computer. They ask, 'What if I break it?' Little by little they trickle in, now they're not afraid anymore, it's the new ones that are afraid"* (11, 128-133).

In all the CTCs, we observed that adults and their teachers work in a classroom separate from the IT laboratory, and that most of them do not come to the CTC. They continue to go to their "informal meeting points", according to INEA tradition.

Instructors' knowledge of ICT

In this section, we analyze the information obtained concerning instructors' training and their perception of ICT usefulness for poor adults.

Personnel training

The people responsible for the CTC are the promoter and IT technician. These are new positions; ALBE teachers were already working for INEA. We will refer to these three positions as "instructors." The promoter usually holds a Bachelor's degree. He or she is a young person chosen because of his/her close contact with the community. The promoter's main functions are: leadership; diffusing CTC services; obtaining donations; looking after the building and equipment; setting schedules, and increasing ALBE enrollment. Most IT

technicians hold two-year IT degrees. Their functions revolve around the equipment and hardware, and teaching basic computing skills. There is a perceived separation between ALBE and the computer lab within the CTC. One technician said: "*The computer room and the INEA are two different things which can't work together.*" (6, 481-483).

Adult teachers have an even more varied background: they can be homemakers, high school students, professionals, or INEA alumni; they are volunteers. The number of teachers associated with the CTC is limited, varying from one to eight, and the number of adults enrolled in INEA programs ranges from 20 to 125. Most teachers continue to tutor adults at meeting points and do not seem to be involved in innovation, except when they come to borrow videos:

> *Some other teachers come to the CTC on Mondays from 4 to 6 p.m. We lend them videos to take home, to teachers as well as to adult learners .* (3, 23-26)

Some of the promoters and technicians received initial training on general topics, such as CTC institutional objectives, administrative regulations concerning CTC operation, diffusion strategies and equipment installation. They think experiences should be shared among pioneering centers via Internet in order to learn from day-to-day experience:

> *They felt training was very vague. 'They just herded us over to a computer.'* (10, 248-250)
>
> *He/she would like to know what the promoters are doing and what they can improve.* (15, 147-149)

The technicians interviewed were trained in using the equipment and ways to treat adults so they would feel comfortable. Trainers told them adults are afraid of computers: *"We were told to be very kind, that if they pressed a button nothing bad would happen, give them some self-confidence"* (11, 44-49).

Adult teachers hardly received any training regarding CTCs and ICT, but in some cases promoters have trained them on-site. Training did not include all personnel; it focused on administrative issues of center's operation and very little on ICT uses for learning and adults' needs. Analysis of initial training manuals indicates instructors' initial knowledge of innovation was vague; the main institutional objective was to increase adult recruitment through the CTCs.

What are the meaningful uses of ICT for poor adults?

Instructors were asked about uses they anticipated for computers and Internet to foster community development. Most said the computer allows people to stay up-to-date, helps them get a better job, and increases adults' self-confidence. Nevertheless, instructors had difficulty providing concrete examples of relevant uses in the lives of poor adults and community groups. In several CTCs, they mentioned that ICT could be useful for women to look for recipes or perform searches on health, or to help young farmers get out of agriculture, as one technician said:

> *A kid who works in the field with his parents is learning computing so that in the future he won't have to work in the field anymore ... I think the computer allows them to change jobs, get out of farming and work as cashiers.* (11, 148-

156)

In most CTCs, instructors are well-informed about the problems of adults and their communities, such as poverty, unemployment, drug addiction, broken homes, illegal immigration, the lack of services, etc.; even so, they do not see the potential contribution of CTCs to support local development initiatives or respond to adults' needs: A promoter mentioned: *"I don't see how the CTC can serve local communities"* (5, 91-94).

In group interviews, a projection exercise was done with instructors from four CTCs in which they were asked to imagine significant uses of technology and potential benefits for adults. Responses were few and far between, and they coincided in that the use of software and Internet could help people in future jobs to seek information or as a means of communicating.

> *For their future as design or engineering professionals. Accountants use Excel a lot.*. (9, 71-75)
>
> *For those who won't make it to professionals, what's the use? I can't answer ... later on we'll be able to tell, it can be of some use, for example, they're learning to draw with Paint Brush.* (9, 75-80)
>
> Would Internet help farmers in your community? *'Yes, there's lots of information about weed killers, new tractors and farming equipment.'* (9, 80-85)
>
> *Maybe it would help poor folks connect with ... the city.* (4, 157-159)

Instructors do not have a strategy to approach locally organized groups, and in two CTCs where a relationship exists, the goal is to enrol adults in ALBE in order to increase adult enrolment statistics:

Have you attempted to establish contact with organized groups? *'We've sought to approach communities. We've established contacts with unions, religious groups and baseball teams' in order to recruit adults.'* (9, 242-245)

According to the above, instructors do not have a common vision as to the potential relationship between the CTC and community daily life: some say this is not part of the objective, while others cannot see the connection. It seems the CTC is perceived as a closed institutional space with little connection to community context. ICT symbolizes many things: modernity, status, an opportunity for a better job, etc., but its educational function is limited to acquiring computer skills, separate from the ALBE learning process (8, 67-62).

Adult instructors' perceptions of CTC objectives

Field observations and interviews with instructors show there are different ways of interpreting the innovation and its purposes. Although interviewees mentioned institutional objectives[12] in a rehash of the message they received in training, four perceptions emerged from analysis of their responses.

It's a "school"

Since ALBE has historically been an open-ended, informal education process, some interviewees see the CTC as an opportunity to follow a classroom-based process, similar to a "school", which tests students, has set hours, and a space in which to offer ALBE and computer courses. The following expressions illustrate this perception:

> For the promoter, the CTC is a school (that's how he refers to it: '*When they come to school'*), and he'd like it to be more "formal", "more classrooms, regular hours, etc." (7, 63-68)

> But the focus is on getting elementary and junior high diplomas: the priority is '*the little school, that's how I call it*', and alternately they learn computer skills two hours a week. (6, 11-116)

It's a computing training center

The CTC is an opportunity to get free computer training in order to obtain a job, since it offers an added value to ALBE: "*it's really important, because in addition to getting basic education, they learn a skill (computing)*" (9, 168-172). Other instructors say the CTC is a place for child and youth computer training as "support" for school assignments. This is a frequent perception, since IT technicians took it upon themselves to offer "introduction to computing" workshops. "The CTC serves the at-large population, especially technical junior high and high school students who want to do homework, do research on the CD-ROMs, etc." (7, 70-75).

It's a tool to promote ALBE programs

In Latin America, ALBE programs have historically faced a problem of low social demand (Schmelkes & Kalman, 1996). Therefore, for INEA instructors, the opening of the CTCs represents an opportunity to attract adults and increase their institutional presence. Promoters and teachers perceive the ICT as a "magnet", since its usual work has been to convince adults: instructors' evaluation and pay depend on the number of students enrolled. However, the way in which technology may interest adults is still unclear, as a promoter stated:

The CTCs give adults a fresh opportunity. This has required a great effort. The centers are still not what we hoped for: we would like attendees, in addition to getting a basic education, to learn computing and watch videos. We've been 'advertised' as an institution, now we offer a more attractive service. What remains to be done is to 'factor in classes.' (8, 327-338)

It's a community center

In contrast to previous conceptions, which were the most frequent, the CTC is rarely seen as a meeting and community support space for different problems youth and adults may have. One promoter, whose background was in community welfare centers, stated: "*It may help teens who've strayed*" (8, 52-55), while another said: "*It's seen as social work, and it helps people in all aspects*" (13, 38-40). Another quote echoes this perception: "*The CTC is like a human relation, and I think that's what makes the model work"* (15, 126-131).

These four CTC perceptions are not abstract ideas in the minds of instructors: they reflect

their own practice. It seems they are trying to comply with a dual objective: promoting the INEA in order to increase adult enrolment and optimizing technological investment, offering what they think the community needs.

Local CTC diffusion strategies and practices

CTC diffusion practices reveal the perception of innovation and the way in which equity of access is promoted. In all centers, a considerable amount of time is dedicated to promotion to recruit adults and to invite residents to use the CTC computers. From our data, three strategies were identified, which are used concurrently:

- **Distribution:** Information is distributed regarding services offered, schedules, location and programs. In order to reach the general public, a wide range of media, such as leaflets, posters, PA-equipped vehicles, banners, etc., are used. This strategy covers an informational objective by advertising ALBE and computer courses, but the message lacks motivational content for adults.
- **House calls:** This strategy is more focused, since it is aimed at the population with the lowest educational level. This is a common practice, since it is the strategy which the INEA has historically used. In the words of a promoter: "*Most work is done house to house, convincing people. They usually refuse, and we have to go back again*" (7, 109-113). Interpersonal communication is used, customizing the message for each person; the goal is to promote the CTC as a "new place" to study ALBE.
- **Conditional access to ICT** : People interested in using computers are encouraged to use them for free, as long as they bring an adult to enrol in ALBE programs. This strategy is aimed at children and teens studying in regular schools; one promoter told kids "*no Daddy, no computer"* (6, 191-193); another showed enthusiasm for his strategy's success: *"youth who studied computing over the summer brought in thirty adults"* (12, 126-129).

In each of these strategies, CTC diffusion messages are de-contextualized, based on an institutional focus and not on adults' field experience. The ICT message is not directed to adults, but rather to anyone who wish to use ICT: "*Bring one or more people to finish elementary or junior high school … and we'll give you a free computing course*" (3, 148-151). The messages are unclear as to the usefulness of the CTC and its target population, while transmitting the idea that ICT is not for adults and has no relationship to ALBE. Posters and pamphlets display the logos of many organisms which sponsor the CTCs, including INEA, CONEVYT, E-MÉXICO, PLAZA COMUNITARIA, SEP, state and local governments, etc. A list of ALBE services and computing courses is provided. The message is saturated and confusing, and in all the CTC communities, residents told us they did not really understand what a CTC was. Diffusion strategy seeks government institutional publicity, rather than informing and motivating the program's target population.

Conclusions and discussion

This exploratory study of the Mexican government's national campaign to create CTCs for poor adults, carried out during the initial implementation phase, shows the target population did not benefit from ICT even though it was provided free of charge. This finding guided deeper analysis of other data which could help explain the phenomenon. The focus was on adult instructors, especially on their knowledge and perception of the innovation and their community diffusion strategies.

Massive implementation of CTCs was a top-down process imposed on an existing structure, the INEA; consequently, ALBE and ICT operated as separate services (Selwynn, 2003). In this context, instructors acquired vague knowledge of the innovation, limited to the administrative procedures for running CTCs, which may have prevented them from anticipating consequences and significant uses for ICT in terms of adult and community development needs. According to Rogers (1983), knowledge is the first stage of the innovation-decision process, in this case mediated by instructors' perceptions.Innovation cannot impose itself because it runs the risk of not responding to the context's needs; when this happens, people look for a way to adapt it (Szabo, 2002).

Data showed instructors constructed different perceptions of CTC objectives, of which four may be singled out: a formal school for adults; a computer learning center; a lure to bring in adults, and a social welfare center. The center promoters' backgrounds provide an explanation for the emphasis they placed on these four objectives, or a combination of them. In fact, these perceptions represent an attempt by instructors to verbalize daily practices they performed in order to implement the new CTC institutional mandate at the local level, in accordance with Giddens' discursive and practical consciences (Ritzer, 2002). In close relation to these practices, diffusion strategies were characterized by a mixture of institutional orientations and instructors' personal initiatives, inspired by habitual ALBE practices. Strategies were grouped into three categories: information distribution, house calls, and conditional access to ICT. Observation and analysis of diffused messages show that these strategies were not specifically addressed to poor adults nor did these motivate them to use ICT.

The ways in which instructors perceive, administer and diffuse CTCs make up a complex of social practices which express the meaning and real objective of innovation in the local context. Although familiar with the structure's norms, instructors transform and reproduce the day-to-day operation of the centers amongst themselves (Gauntlett, 2002). These practices reveal that instructors strive to comply with the institutional structural mandate while reproducing known routine practices (Cohen, 2001), with the objective of increasing adult recruitment and therefore improving their salary. In this day-to-day activity, practices are institutionalized (Shennan, 1989), and the dialectic interrelation between structure and human agency set forth by Giddens (Ritzer, 2002) is manifested.

Instructors substitute their initial lack of knowledge regarding ICT usefulness; they do not seek to attract adults by relating their needs to technological uses. These results suggest that limited initial knowledge of innovation, the lack of an institutional strategy to promote equity of access, and instructors' daily practices, are mediating factors which lead to a deepening of the digital divide in strongly unequal social contexts. This perspective differs from diffusion studies research, which has focused on the success or failure of innovation, carefully analyzing the stages established in a linear process theory. Thus, the expected contribution of this study is on better understanding the social complexity of the innovation process, whereby social agents involved in practices are able to institutionalize courses of action.

Pursuit of this research led to the design and piloting of a socio-educational model which has sought to bring ICT closer to adult learner needs in rural and Native communities. The results were published in another article (Salinas, Huerta, Porras, Amador & Ramos, 2006). In order to further extend research on this topic, we recommend that studies on social representation and initial expectations regarding ICT be carried out with instructors as well as adult learners. Thereby, comparative analyses should be performed on different ICT diffusion strategies in the context of poverty and their effects on equity of access.

References

Berg, J. (2005). Perceived consequences of adopting the Internet into adult literacy and basic education classrooms. *Adult Basic Education, 15*(2), 103-121.

Cisneros, M. (2005). *Monographie sur les nouvelles technologies en éducation des adultes au Québec.* Montréal: Institut de coopération pour l´éducation des adultes.

Clarke, A. (2005). Towards an e-inclusive society. *Adults Learning, 17*(4), 24-28 .

Cohen, I. (2001). *Teoría de la Estructuración y Praxis social.* In A. Giddens & J. Turner (Eds.), La teoría social hoy (pp. 351-397). Madrid: Alianza Universidad.

CONEVyT (2001). *El Consejo Nacional de Educación para la Vida y el Trabajo*, Programa de Mediano Plazo 2001-2006. (Official Report). México: CONEVyT, Dec. 2001.

Gauntlett, D. (2002). *Anthony Giddens: The theory of structuration.* Retrieved May 4, 2006 from http://www.theory.org.uk/giddens2.htm

Giddens, A. (1984). *The Constitution of Society: Outline of the Theory of Structuration*. Berkeley: University of California Press.

Hopey, C. (1999). Technology and adult education: rising expectation. *Adult Learning. Summer, 10*(4), 26-29.

Jaffee, L. (2001). Adult literacy programs and the use of technology. *Adult Basic Education, 2*(2), 109-124.

Kalman, J. (2004). *Saber lo que es la letra.* México: Siglo XXI editores, p. 190.

Kotrlik, J. & Redmann, D. (2005). Extent of technology integration in instruction by adult basic education teachers. *Adult Education Quarterly , 55*(3), 200-219.

McCook, K. (2002). *Rocks in the Whirlpool: Equity of Access and the American Library Association*. Annual Conference of the Executive Board of the American Library Association, June 14, 2002. p. 69.

Proenza, F., Bastidas, R. & Montero, G. (2001). *Telecenters for socioeconomic and rural development in Latin America and the Caribbean.* Washington: FAO, ITU, IADB.

Ritzer, G. (2002). *Integración Acción-Estructura.* In Teoría Sociológica moderna. Madrid: McGraw-Hill Interamericana.

Rogers, E. (1983). *Diffusion of Innovations*. (3rd ed.). New York: The Free Press.

Salinas , B.; Porras, L.; Huerta, G. & López, E. (2004). *Otra mirada a la demanda educativa y la contribución de la familia al aprendizaje de los hijos*. Autopercepciones de madres rurales pobres: mediadoras de equidad educativa y digital. Fondo de investigaciones educativas, Programa para la Reforma Educativa en América Latina (PREAL): Santiago de Chile, 103p. Research Report published on www.preal.org/FIE/propuestas2/php

Salinas , B., Huerta, G., Porras, L., Amador, S. & Ramos, J. (2006). Uso significativo de la tecnología en la educación de adultos en el medio rural: diseño y aplicación piloto de un modelo. *Revista Mexicana de Investigación Educativa, Vol. XI,* (27), 31-60.

Schmelkes, S. & Kalman, J. (1996). *Educación de adultos: estado del arte*. México: Instituto Nacional para la educación de los adultos.

Selwyn, N. & Gorard, S. (2004). Where now for ICT and adult learning? *Adults Learning, 16*(3), 8-10.

Selwynn, N. (2003). *ICT in non-formal and adult education: supporting out-of-school youth and adults*. NCAL-OECD International Roundtable, Nov. 12-14, 2002, Pensylvania.

Servon, L. & Nelson, M. (2001). Community technology centres: narrowing the digital divide in low-income, urban communities. *Journal of Urban Affairs, 23* (3-4), 279-290.

Shennan, S. (1989). *Cultural transmission and cultural change*. In S. Van der Leeuw & R. Torrence (Eds.) What's New? A closer look at the process of innovation, One World Archeology, 14 (pp. 330-345). Cambridge: The University Press.

Szabo, M. (2002). *Educational reform as innovation diffusion: development of a theory and test of a model using continuing professional development and instructional technology*. Paper presented at Informing Science, Cork Ireland. June 2002

Warschauer, M.; Knobel, M. & Stone, L. (2004). *Technology and Equity in Schooling: Deconstructing the Digital Divide. Educational Policy, 18*(4), 562-588.

Footnotes

1 The official name for CTC in adult education is "plazas comunitarias" (community plazas).

2 Led by President Vicente Fox, the conservative Partido Acción Nacional (PAN) is the first opposition government to reach power in Mexico following 70 years of hegemony by the Partido Revolucionario Institucional (PRI).

3 Source: Estimaciones con base al II Conteo de Población y Vivienda 2005; Estadística Básica del Sistema Educativo Nacional, inicio de cursos 2005-2006, SEP. Retrieved August,

21, 2006 from http:// www.inea.gob.mx/wps/portal

4 The salary they receive is very low and is tied to "productivity", that is, payment is per exam passed or school year completed. Administrative personnel have permanent positions, fixed salaries, and benefits. At the regional and local level, there are area coordinators and educational technicians, whose activity revolves around meeting numerical objectives in order to raise the national academic enrollment index. They receive continuous training from the INEA, which is not always the case with teachers because of their high turnover rate.

5 CONEVyT (2001). Consejo Nacional de Educación para la Vida y el Trabajo, Programa de Mediano Plazo 2001 - 2006. Mexico City, Dec. 2001

6 The total obtained from the sum of CTCs per state. Retrieved June 16, 2005 fromhttp://www.conevyt.org.mx

7 Boletín de prensa, 29 de junio, 2006 "Cumplirá INEA meta presidencial de plazas comunitarias". Retrieved August, 21, 2006 fromhttp://www.conevyt.org.mx/boletines/docs/290606_jal.pdf

8 The ICT for education and social development research group (*TIC para la educación y el desarrollo social)* belongs to the Universidad de las Américas-Puebla, Mexico. The group members who actively participated in the broad study were, Guadalupe Huerta, Laura Porras, José Ramos, Antonio Santos and Bertha Salinas. The latter is responsible of this article, since it implied a further theoretical elaboration and data analysis.

9 Source: CONEVyT-INEA, Plazas comunitarias e-México institucionales (December 2001 and February 2002).

10 Quotations code indicates the Ethnograph source file and lines numbers extracted.

11 CONEVYT-INEA: Quantitative and qualitative results of the piloting of instruments in "plazas comunitarias" in 4 states, Official report. September 2002.

12 In the INEA publication entitled Las Plazas Comunitarias: Nuevos espacios educativos, in the section called ¿Qué son las plazas comunitarias? it is stated that "they are educational spaces where youth and adults who have not completed their basic education are given priority, and where the whole of the population may attend to make use of educational services, since the CTCs are of and for the community" (p. 2). In terms of their objective, it is stated that "they were created in order to ... [offer] access to scientific and technological advances which have developed in the past few years, and so that users may use these technological advances as a means among others to conclude their basic education, develop competencies linked to the working and social world, or simply for cultural or recreational purposes" (p2).

ISSN: 1499-6685