

Rivera, H. (2008). Bridging the technology gap for low-income Spanish-speaking immigrant families. *AACE Journal*, 16(3), 307-325.

Bridging the Technology Gap for Low-Income Spanish-Speaking Immigrant Families

HECTOR RIVERA

Southern Methodist University

Dallas, TX USA

hrivera@smu.edu

Research shows that families have a powerful effect on children's success in school. Parental involvement at home and in school is positively associated with children's school readiness and significant school performance. This study is focused on examining the impact of an intervention technology program—Community Learning Centers—(Centros Comunitarios de Aprendizaje - CCA) designed to assist Spanish-speaking immigrant parents in learning and using technology for family advancement. The study is based on a sample of 377 participants of the program. In general, participants reported positive attitudes on what they perceive to be the impact of the CCA program for their lives. Participants were also of the opinion that what they are learning in the CCA will be helpful for assisting their children with school related activities at home as well as for their involvement in their children's classroom. Overall, pre and postsurvey data suggests that the program is achieving its objective of providing technology literacy to parents as well as the means by which they can become participants in the education of their children.

The persisting gaps between mainstream population and Hispanics in technology results in differential access to educational and economic opportunities (U.S. Department of Commerce, 1999). It contributes to inequitable social outcomes and to less economic opportunities for Spanish-speaking immigrant communities. Research shows that 55% of the Hispanic

immigrants in Houston, Texas, do not have a high school education, placing the area's fastest-growing ethnic group in a perilous position in our knowledge-based economy (Klineberg, 2005). According to the Houston Area Survey, the educational attainment of Hispanics—who comprise one third of Houston's population—lags far behind that of Anglos, African-Americans, and Asians (Klineberg).

The low education level among Hispanic immigrants is exacerbated by a modern proliferation of technology that has made basic computer knowledge fundamental to a person's academic and occupational success (President's Advisory Commission on Educational Excellence for Hispanic Americans, 2003). Among the many challenges facing Hispanics in the United States are a widespread lack of familiarity with basic computer technology and a lack of access to computers and the Internet at home. Because many Hispanic immigrants have neither higher education nor computer knowledge, they not only experience severely curtailed employment opportunities, but they also lack the resources necessary to assist and participate in their children's education (President's Advisory Commission on Educational Excellence for Hispanic Americans; U.S. Department of Commerce, 1999).

Prevalent in Hispanic families is what the Mexican Institute has termed the "upside-down model"—a social paradigm in which the children of immigrants become the de-facto leaders in the family because they speak English and receive ongoing education that often includes computer training. This de-facto model devastates healthy family dynamics and completely undermines parental authority; Hispanic parents are unable to navigate the U.S. school system or unable to help their children with homework, and the children, in turn, cease to view their parents as role models. Furthermore, the lack of access to computer technology in Hispanic communities is manifested in two ways: lack of infrastructure/connectivity in these communities, and the fact that computer instruction, where available, is not provided in Spanish.

A significant response to this problem has come from The Mexican Institute of Greater Houston. They have accepted the challenge and demonstrated that given the right conditions, Spanish-speaking parents from underrepresented communities can also achieve their educational goals through the use of technology. Uniquely, the Mexican Institute focuses on Hispanic parents as the key figures in family advancement. To provide innovative education

opportunities for these parents, the Institute is collaborating with the Texas-accredited Tecnológico de Monterrey, in Mexico, to offer distance-based computer education programs to Hispanic adults (in Spanish) across Houston. In partnership with the Houston Independent School District and numerous community based organizations, the Institute has established Community Learning Centers (CCAs) where Hispanic parents can take computer technology courses and receive tutorial help in Spanish through the Internet. These CCAs have proved be a realistic means of empowerment for Hispanic parents, providing them with opportunities for self-improvement through online education, which in turn, allow them to become positive role models who influence their children to stay in school.

The Community Learning Centers (CCAs) provide Spanish-language classroom instruction and online tutorials in computer technology, allowing Hispanic parents—many of whom never finished primary school and cannot operate a computer—to learn marketable computer skills in a nonthreatening, peer group setting. The diploma obtained at the completion of the 100-hour program that keeps parents at the schools for 16 weeks, is the first education certificate many of these parents have ever received. As a result, many of the graduates of the program have continued their online education by taking other free courses offered by the Mexican Institute such as web page design, basic statistics, and health related courses. By partnering with local schools and other organizations in establishing CCAs, the Mexican Institute has developed a cost effective, easily duplicable approach to adult online education. The program uses the internet connectivity, classroom facilities, and computer resources already in place at the schools, and in turn, it works to foment parental involvement in their children's education at home and in the classroom.

In the past, research has shown that family aspirations and expectations for their children's academic success differ due to the fact that parents are not able to aide their children in school related activities or assist them in their educational path (Gallimore, Reese, Balzano, Benson, & Goldenberg, 1991). However, the community learning centers are not only training parents on the use of technology but also connecting their technology training in meaningful ways in which parents may be a positive influence on their children. For example, a survey participant expressed her opinion about the usefulness of the program, "Yes, I will have more opportunities to find a job and I will be able to help my children with their school work" (participant, RLC-06). The post survey evaluation of the program indicated

that, across time, parents did not change their positive perception on the usefulness and positive impact of the program. Parents are beginning to develop a sense of self-efficacy through their participation in the CCAs despite the fact that most of the parents who come into the centers are computer illiterate. In most cases, they don't even know how to turn on a computer or how to use the computer's mouse. However, by the time they finished the program they are equipped and empowered to action. For example, a survey participant stated "I wish to work on my own business and I needed to prepare myself for it. So I can achieve a better business and use the Internet to manage it from my computer" (participant, BMS, 52104).

Significance of parents' training and further educational development.

Research shows that families have a powerful effect on children's success in school. Parental involvement at home and in school is positively associated with children's school readiness and significant school performance (McDermott, 2006; Lopez, Kreider, & Coffman, 2005; Morrow & Young, 1997). However, Spanish-speaking parents face many obstacles to be effectively involved in the education of their children. The focus of many immigrant Spanish-speaking parents is on working one or two jobs to provide their children with the essentials for life. But, as children mature and continue to move along their educational path, the need arises for a more direct parental involvement that would allow for parents to exercise a direct influence on their children's academics and life choices. Compounding the situation is the parents' lack of education that may be an obstacle to their upward mobility or in securing a better job in the future. The financial and educational demands faced by Spanish-speaking parents represent an at-risk community ecology that serves to perpetuate a cycle of poverty, lack of knowledge, and lack of involvement in guiding their children's schooling (Bronfenbrenner, 1986). Therefore, education in their native language and the development of technology skills are key components that parents need to effectively participate in their children's education as well as to advance as a family. This is not to claim that parents have nothing to contribute to their children's education, as a matter of fact, the research literature suggest that parents have much to contribute to their children education such as the value they place on academic achievement or cultural practices that aide children towards a positive identity formation (Gallimore et al., 1991; Gallimore, Boggs, & Jordan, 1974; Moll, Amanti, Neff, & Gonzalez, 1992). However, parents also want the opportunity to be able to do more for their children such as guiding their educational development through informed decisions as well as assisting their children with school related activities at home.

The significance and the complexity of parental involvement in their children's academic development has been well documented (Grolnick, Benjet, Kurowski, & Apostorelis, 1997; Gallimore et al., 1991; Bronfenbrenner, 1979). In a four year study conducted by Delgado-Gaitan (1991), she examined a school district's attempt at incorporating parent-involvement activities to encourage isolated Spanish-speaking parents to participate more fully in their children's schooling. Her findings suggest that conventional avenues for involving parents in school were closed to many parents because specific cultural knowledge and language were required in order to participate effectively. She concluded that when socio-cultural congruency exists between home and school settings, children have a greater chance of succeeding in school. Her findings suggested that parents who are knowledgeable about the school's expectations and the way in which the schools operate are better advocates for their children than parents who lack this knowledge (Delgado-Gaitan). To make matters more difficult, Spanish-speaking parents are also facing a digital divide that further separates them from being involved in their children's classroom as well as separate them from their children's academic activities at home. To reduce the gap in overall parental involvement, it is necessary to develop programs that are contextual to the needs of the schools and classroom teachers as well as to the needs and social reality of the parents and children within their neighborhoods (Barton, Drake, Perez, St. Louis, & George, 2004; Padron, Waxman, & Rivera, 2002).

The literature on the development of effective prevention programs also suggests that strong families and effective parenting are critical to children's future developmental outcome. Parents need more than ever to know how to effectively guide their children (Kumpfer & Alvarado, 2003). In a longitudinal study researchers also concluded that parents have a large impact on their children's future behavior than previously thought. Therefore, parents' involvement in their children's education is an important point of leverage for any program seeking to improve children's academics (Resnick et al., 1997). In general, researchers have also found that parents' training programs are most effective when (a) the training focuses on assisting younger children (3 to 10 year old); (b) the training can be generalized to the home setting; and (c) when the approach is contextual to family and community needs (Kumpfer & Alvarado). Overall, research also suggests that the road to greater success includes prevention program that are based in scientific findings and community-based models of accountability and technical

assistance systems (Wandersman & Florin, 2003; Israel et al., 2000; Cochran, 1988; Braun, 1997).

METHOD

Characteristics of CCA Participants

Overall, there were 34 CCAs participating in the survey study. The survey was conducted during the first semester of 2004. From those centers, 377 Hispanics consented to participate in the study. Descriptive analysis of the data revealed important characteristics of the participants. Overall, 17% of the participants were males and 83% were females. People participating in the CCAs come from diverse backgrounds. The majority of participants are from Mexico (79%) but there were 17% that include participants from Central America, South America, and the Caribbean and 4% who represent Hispanics born in the USA. On average, participants reported having lived in the USA for 13 years (answers ranged from 1 year to 62 years). The age of those participating in the program ranged from 14 to 63 years old. The mean was 35 years old, and the mode was 32 years of age. Of those participating in the program, 83% of the parents reported having children in school, and 17% reported not having children in school. In general, the grade level of their children were 42% in elementary school, 13% junior high and high school, 40% reported having children at multiple levels of school such as elementary, junior high, high school, or college, and 5% reported having sons and daughters in college only. Participants were also asked about their educational background. Overall, 77% reported having studied in their country of origin, with 8% in the USA only, and 15% reported having studied in both countries. Overall, some participants reported having achieved a high school level of education (11%); however, their answers varied from starting their freshmen year in high school to actually finishing high school. The majority of participants reported having achieved a middle school level of education or less (68%).

Instrument

In general, the study involved two questionnaire/surveys. The first questionnaire contained 21 items addressing ethnic background of participants as well as socio-historical information on the participants' educational and

work experience and their experience with technology. A second survey was developed for the purpose of assessing participants' attitudes, beliefs and perceptions about technology and their technology skills. This second survey contained a total of 91 items; 67 of the 91 items were rating scales on participants' opinions, beliefs and values. This second survey was administered as a pre and postassessment instrument (all instruments were developed in Spanish). Overall, the surveys had mostly structured questions, but it also included follow-up open questions for participants to provide a thicker description of their views and opinions about the program.

Two other instruments were used for constructing a description of the community and its resources. The data presented, from these two instruments, is archival data collected on previous studies of the same community. The instruments include: (a) The School Attendance Area Survey-Literacy (SAAS-L), and (b) the School Attendance Area Survey-Drive (SAAS-D). Both instruments are focused on providing an inventory of the resources available in the communities/neighborhoods where the CCAs are located. The SAAS-L is focused on assessing the present of literacy resources as well as the general look of the neighborhood where Hispanics reside. Whereas, the SAAS-D involved the process of driving through every street in a neighborhood to document and map the general look of the neighborhood, including visible resources and services within the community as well as language preponderance (e.g., Spanish, English, or other).

Procedure

To assess the extent to which the program produced the broad scale changes envisioned and to examine the efficacy of their strategies, in this study, the researcher engaged primarily in two data collection activities. First, on a Needs Assessment to gather information on past activities as well as to guide the future course of the formative and summative aspects of the study. To accomplish this task, archival data (from the Mexican Institute) were examined to assess past accomplishments by the institution. The second data collection activity involved the development of questionnaires aimed primarily for the formative and summative components of the study. This process involved formal meetings with the program's executive director and personnel. It also involved participant observations of their annual activities such as attending two of their community conferences and the inauguration

of one of their CCAs. Researchers also visited two of the CCAs located within the public schools. During those two visits, informal conversations were carried out with some of the parents, participating in the program, to inform researchers about parents' perceptions about the program. As a final procedure, focus groups were conducted, at two CCA centers, to assess the validity of the survey instruments.

Items from the presurvey, administered at the beginning of the program, based on a sample of 377 participants, are explored in this study as well as survey results from a subsample of the population ($N = 49$). These were a sub-sample of participants who agreed to participate in the pre and postsurvey study. Overall, this study is limited to answering the questions pertaining to the success/impact of the program to the parents' technology skills as well as to their values, beliefs, attitudes, and perceptions of the importance of technology and education for their families. The direct effect of the program in children's academic is a longitudinal research question under exploration that is not addressed in this article. However, the view and beliefs of the parents concerning this issue are explored and educational inferences are drawn on the indirect effect that the program is having on the children of these parents participating in the CCA technology program.

RESULTS

The Ecology of the Community

Families attending the CCAs live in neighborhoods that in many respects lack the resources and the infrastructure for family improvement and social advancement. In the following section a typical neighborhood is presented to illustrate some of the needs that have been fulfilled by the CCA program.

La mission (pseudonym) is a neighborhood located in the eastern part of the city of Houston. Historically, it has been a predominantly Hispanic area. This section of Houston is comprised of many blue-collar businesses, an industrial area, and a residential area. Some Hispanic families have lived here for two or three generations. However, there is also a preponderance of Spanish-speaking immigrants whose children attend the local public schools. As a whole, the community's infrastructure looks old and dirty as illustrated by piles of junk and trash that are found around the area (SAAS-D, observers'

field notes). Overall, the residential area is comprised of old homes with a few exceptions where you find a new home in between.

In general, the commercial make up of this neighborhood includes car dealerships, and stores that serve as multi-purpose stores, which include check cashing services, sending money to Mexico and immigration/legal services. There are also two industrial subsections within the neighborhood. In the industrial areas, one can observe big warehouses for import and export of industrial parts and products. Overall, the neighborhood appears to represent a working class neighborhood, which historically has had a high concentration of Latinos/Hispanics within its boundaries. No major chain stores or general bookstores are present in the neighborhood. Among the two mom and pop convenience stores visited, there were signs displayed in both English and Spanish, and the range of literacy resources was limited to greeting cards, and free local news papers in Spanish. No books for children, no books for adults, magazines or other children consumables were found (SAAS-L, field notes).

Over all, resources appear to be limited in this neighborhood. The survey of the community resources also indicated that there are only two churches located in this neighborhood. The churches are nested within the residential area. No other facilities or social service centers were observed in the neighborhood area. There are no parks or recreational facilities within what is generally describe as the neighborhood area. However, observers familiar with the area reported that there were two parks, although outside of the neighborhood, Turtle Park and Selena Quintanilla Park, which residents of La mission neighborhood use as recreational facilities. Although, it may be the case, some families are not able to use those resources due to a lack of transportation.

The type of facilities and services found within the community seem to suggest that the target clientele are members of the Latino community. The two churches around the area were both advertising services in Spanish. The small mom and pop stores also had signs in Spanish and one of the clerks, from Pakistan, indicated that it was necessary to speak Spanish to conduct a successful business in the community. Also the type of consumables found inside the stores suggest a focus on catering to the Hispanic community. However, both surveys revealed a lack of resources or facilities focused on providing educational training for family advancement and social improvement. Overall, the general findings, on the type of resources or lack of

resources, in the neighborhood represent the social reality of this community as well as other neighborhoods where the SAAS surveys were also conducted. The neighborhood surveys paint a grim picture of the ecology of the community and it is indicative of how a cycle of poverty is perpetuated in such social context. However, it also provides an understanding on the points of leverage for community development. Hispanic immigrants are highly motivated to learn and given the opportunities and resources they are capable of improving their lives and the lives of their children.

The work environment of CCA participants. This section on the work environment represents an effort to understand the ecology of the family in reference to access and opportunities for literacy and use of technology. Of the 377 who participated in the survey, 144 reported having a job, 201 reported not working, and 32 did not answer the question. In general, of those not working 82% reported not working for six months or more and 18% reported not having a job for less than six months.

On the other hand, participants who reported having a job ($N = 144$) were asked about the language most often used at work. Overall, 16% reported using English; 36% reported using Spanish; 48% reported using both languages (Spanish/English). In reference to their use of literacy skills at work, only 37% of the parents reported having to do some type of reading at work and only 33% reported doing some sort of writing at work (e.g., writing/reading work orders or filling out inventories at work).

Parents were also asked if they use computers at work. Only 27% indicated using computers at work. However, it is important to note that as we inquired on activities requiring literacy or the use of technology, the general trend indicates that fewer participants are involved in such type of technology activities at work. This may be indicative of the lack of resources and opportunities available to the Spanish-speaking community, which in return, do not allow for their upward mobility.

Addressing Key Community Needs

Within the Hispanic neighborhoods, the Mexican Institute identified a lack of access to technology in the communities as the main barrier that needed to be overcome. This lack of access manifested itself in two forms. First,

there is a lack of infrastructure or technology connectivity in the Hispanic neighborhoods. Secondly, there is a lack of opportunities to learn computer skills in the community's native language.

Examining the impact of the program at the community level. Overall, the findings show that in a brief period of three years (when this study was conducted), the Mexican Institute has experienced a dramatic increase in the number of CCAs operating in Houston's public schools. For example, in 2002 there were six centers operating in Houston. In 2003, 15 new centers were added, and by the end of May 2004, there were 40 new centers added to their network; this brought the total number of center to 61 including centers within community-based organizations, community colleges, and public schools. This is indicative of the impact and success of the program in creating a technology infrastructure within these disadvantage communities (Table 1).

Table 1
Program Growth and Impact Across Time

Activities	2002	2003	2004	Total
Number of new operating CCAs	6	15	40	61
Number of graduates from CCA program	52	373	894	1,319

Another point of leverage for community building has been their concentrated effort to reduce the digital gap within the homes by making computer technology available and affordable to the families. The Mexican Institute, in collaboration with Genesys IT, acquires refurbished computers at a very low price (ranging from \$150 to \$350), which in turn, are sold to the participants after completion of the program. These computers are equipped with all of the software and hardware required for the parents to continue their education online and to work with their children on school-related activities at home. During the time of the study 57 computers had been sold to families. Currently, a total of 126 computers have been sold to families and 20 participants have continued their education online by taking new courses such as HTML for web-page design, health related courses, and basic statistics. In the next sections we begin to address the impact of the

program to individual participants as well as potential impact to the family unit, as perceived by program participants.

Examining the impact of the program on individual participants. On the average, each center supports 19 participants per class. The Mexican Institute offers two technology-training courses per year. The rapid growth of the program points to the needs within the community; furthermore, it points to the program's positive impact on the community on how these needs can be ameliorated by training parents to become a positive influence in their community as well as in their children's lives. By the end of 2004, the program had graduated 1,319 parents from the 100 hours technology course (see Table 1). The graduation ceremony is called "Día de la Familia" (Family Day). Before, during and after the ceremony parents are encourage to visit information booths set up by more then 20 educational and health organizations that provide parents and their children with information on other programs available to them as well as new courses they can take in the future. This is an empowering event that allows parents to see the resources available to them and how they can further assist their children in their educational development.

Participants' perceptions on the worth and merit of the CCA program. SPSS MANOVA was used to examine differences on attitudes, opinions, and beliefs about technology. The dependent variables were a set of 67 structure questions focused on examining the efficacy of the intervention program as well as to examine participants' beliefs on the impact of the program to their lives and their children. These dependent variables were subsequently analyzed with a set of independent variables including Level of Education, Gender of participants, and Language (whether participants spoke Spanish only, or both languages Spanish/English). The analysis examined if participants' attitudes towards using computers, the importance of the program, and future aspirations are significantly different as a function of the above independent variables. Overall, the findings show no significant main effects for Level of Education, Gender and Language. Also, no significant interactions were found between these variables. Overall, this suggests a high degree of consensus on the attitudes, opinions, and beliefs among participants in the CCA program across geographic communities and settings.

Participants were asked about their attitudes and perceptions in reference to learning and using technology. Overall, 83% ($N= 377$) perceive the CCA program as a useful learning experience to improve their current job status. On the other hand, 98% of the participants are of the opinion that the CCA training will provide better opportunities for future employment as well. Additionally, 81% of the participants believe that what they are learning about technology at the CCA will be helpful for assisting their children with homework. For example, a parent expressed that “the program will be useful for many things; primarily, it is motivating for my son to see me taking this course” (participant # LE-02). In general, the participants’ comments appear to suggest that they are making clear connection on the usefulness and importance of computer training not only for their immediate jobs but also for their future employment. They are also making connections on the implications of their computer training in their children’s education as they become involved in school related activities.

Participants were also asked whether their participation in the program would increase the chances of employment. 91% agreed that it would increase changes of employment. Also, 93% expressed that what they are learning at the CCA is applicable in many areas of their lives. In general, they also had a positive attitude about technology. Overall, 98% indicated that what they are learning at the CCA is worth learning. These findings suggest that the program is connecting to participants’ lives and it is meeting their expectations and needs. Overall, no pre and post program differences of opinions and beliefs were found. This suggests that participants finished the program with the same positive attitude and perceptions with which they had started.

Immigrant Parents are Learning Technology Skills

Paired sample t -tests were used to examine pre and postsurvey data on participants’ technology gains at the end of the program. In the preassessment survey parents reported that to use computers was a difficult task for them to perform. However, in the postassessment survey they reported that to use computers was not a difficult task any longer $t(48) = 2.40, p = .02$. This is indicative of their growth in learning how to use computers. To further examine participants’ gains on the use of computer technology, other paired sample t -tests were carried out. Items were focused on determining

what parents did not know when they entered the program and assessment of what they knew at the end of the program. The scale used gave parents the option of identifying the skills or procedures they “could not do”; those they “could do with the help of someone else”; and those skills and procedures they “could do by themselves.”

Overall, on the use of Microsoft Word, parents reported significant gains $t(47) = 3.86, p = .0001$, on being able to use the program beyond the basics (e.g., paste photos, or to import or paste text from one file to another). Figure 1 shows the magnitude of the effect on learning how to use Microsoft Word. Half of the parents appear to be able to use the program during preassessment, but this is mainly due to the fact that in some centers the preassessment was given late while participants were already learning to use the Word application. Other significant gains were observed on the use of Microsoft Excel. On the pre assessment, 69.4% of the participants indicated that they could not use excel or they can only do it with the assistance of an expert other, however, in the posttest 81.6% reported being able to perform Excel tasks by themselves, $t(47) = 5.28, p = .0001$ (Figure 2).

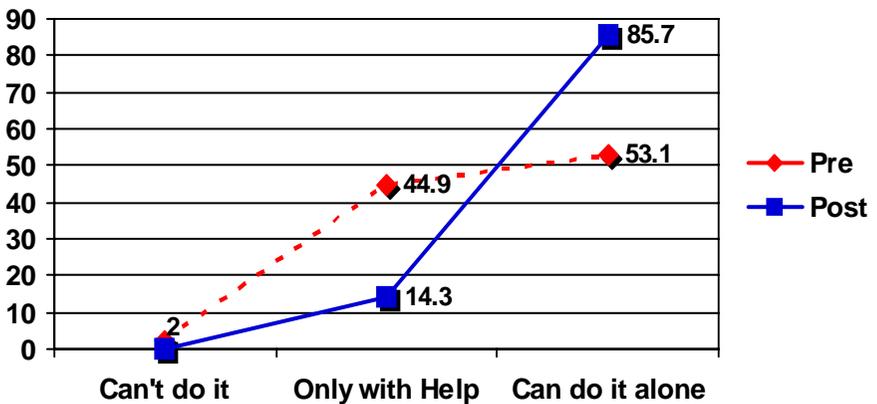


Figure 1. Parents are learning to use Microsoft Word

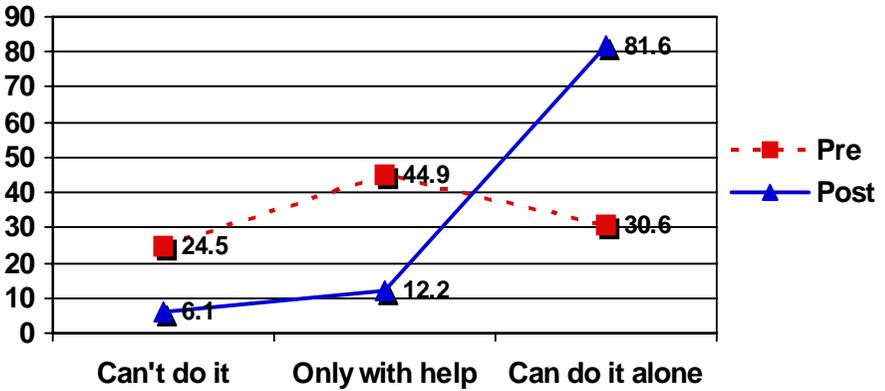


Figure 2. Parents are learning to use Excel

Significant gains were also observed on the use of Microsoft Power Point application, $t(45) = 7.23, p = .0001$. Over all, at the beginning of the program 83.7% of the parents reported that they could not use the program or they can only do it with the assistance of an expert other, however, in the postassessment 85.7% reported being able to perform PowerPoint tasks by themselves (Figure 3). Overall, parents reported having gained an understanding of the operations of computers such as creating a folder, copying a file into a disc, opening/using email accounts, and using the World Wide Web to conduct Internet searches. Parents moved from having difficulties using the computer as measured on the preassessment survey to a point where they were performing difficult tasks such as designing PowerPoint presentations or developing databases in Microsoft Excel and conducting internet searches.

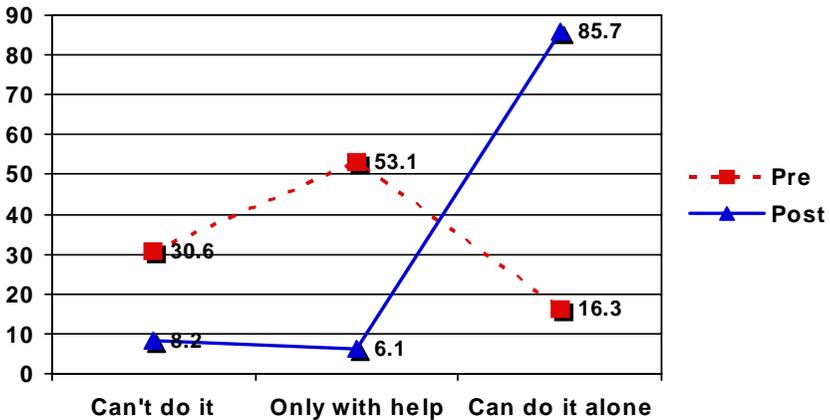


Figure 3. Parents are learning to use Power Point

For example, in one school, a group of seven mothers, after graduating from the technology program began to volunteer in assisting their children's kindergarten teacher in developing PowerPoint presentations as part of the teacher's lessons. The PowerPoint presentations were focused on teaching children the ABCs, colors, and dollars and cents. The project was the brainchild of a kindergarten teacher who noticed that the course been offered to parents at his school included a section on PowerPoint. Needing simple, visual lessons for his five-year-old students, he proposed that the computer class help him create PowerPoint presentations. The women had to learn more than the mechanics of PowerPoint for the project. Each had to pick a theme to teach, such as ABCs or colors and then design each frame of the presentation by using clip-art, colors, graphics, and shapes from Microsoft Word and the Internet. As noted by the student conducting the interviews, "one wouldn't realize that each presentation is a monument to the resolve and triumph of the seven Hispanic mothers who created them. Six months ago, these women could barely turn-on a computer" (interviewer's field notes, January, 2005).

The applicability and significance of the program is not only measurable by its success in teaching parents computer skills. Many of the program graduates have also obtained more gainful employment or pursued continued education opportunities as a result of the computer course. A growing archive of success stories can be found at the Mexican Institute's Web site, <http://www.mexico-info.com/>. These accounts include the story of a CCA graduate, from Mexico, who went on to become a highly skilled, highly paid computer technology instructor; a hotel cook whose new computer skills landed him a job in the hotel's main administrative office; and another Mexican woman who now works as a secretary for a phone-card company whose calling cards she used to hawk on city streets. Over the last three years, 55 graduates have been trained as CCA coordinators/facilitators and others as online tutors/mentors for the Mexican Institute itself. These job opportunities have created new avenues for better employment and professional development for these individuals, at the same time that many of them are also empowered to participate in the education of their children in ways previously not available to them.

CONCLUSION

The study suggests that given the appropriate resources, Hispanic immigrants will make significant gains educationally and socio-economically. The Mexican Institute is providing valuable resources that serve as a technology pipeline for Spanish-speaking parents. Their CCAs program involves a series of coordinated efforts affecting a number of different components on the education and development of the Hispanic community. Parents reported a sense of self-efficacy and the findings suggest that they have been empowered by the processes within the CCA. There is also a legacy left behind in the number of centers currently operating within the public schools, community-based organizations and community colleges. New districts, new cities, and new states are being added to what is likely to become a national community-building network.

The lessons learned from this study represent a guiding mechanism in an effort to inform future delivery of services to Hispanic immigrants. The study also pin-points that under the right conditions the digital divide, that seems to threaten the future of Hispanic immigrant families, can be overcome when the needs of the community are addressed appropriately in context.

It is hoped that this study identifying the activities and the greater potential of this program will have a modest impact on the trajectory and shape of the educational process for underrepresented communities such as Hispanics. Overall, efforts to better the lives of Hispanic immigrants have moved program practices in a direction that is generally considered to be an improvement for the Hispanic community. This improvement has begun to occur at the individual level for some families as well as in some communities. The evidence also shows that the process of involving parents in their children's education has, in fact, left behind a legacy of new and improved frameworks for parental involvement in their children's education. It has also aided in establishing a technology network within the public schools and partnering arrangements to increase the number of access points in the communities. We hope that this study will have a positive impact in educational policy and to the future efforts for providing technology education and technology access for the Spanish-speaking community across the nation.

References

- Barton, C.A., Drake, C., Perez, G.J., St. Louis, K., & George, M. (2004). Ecologies of parental engagement in urban education. *Educational Researcher*, 33(4), 3-12.
- Braun, D. (1997). Parent education programmes. In K.N. Dwivedi (Ed.), *Enhancing parenting skills: A guide for professionals working with parents*. New York: John Wiley and Sons.
- Bronfenbrenner, U. (1979). Beyond the deficit model in child and family policy. *Teachers College Press*, 81, 95-104.
- Bronfenbrenner, U. (1986). Ecology of the family as a context for human development: Research perspectives. *Developmental Psychology*, 22, 723-742.
- Cochran, M. (1988). Between cause and effect: The ecology of program impact. In A.R. Pence (Ed.), *Ecological research with children and families: From concept to methodology*. New York: Teacher College Press.
- Delgado-Gaitan, C. (1991). Involving parents in the schools: A process of empowerment. *American Journal of Education*, 100, 20-46.
- Gallimore, R., Boggs, W.J., & Jordan, C. (1974). *Culture, behavior and education: A study of Hawaiian-Americans*. London: SAGE.
- Gallimore, R., Reese, L., Balzano, S., Benson, C., & Goldenberg, C. (1991, April). *Ecocultural sources of early literacy experiences: Job-required literacy, home literacy environments, and school reading*. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.
- Grolnick, W., Benjet, C., Kurowski, C., & Apostoleris, N. (1997). Predictors of parent involvement in children's schooling. *Journal of Educational Psychology*, 89(3), 538-548.
- Israel, B., Shulz, A., Parker, E., Becker, A., Allen, A., & Guzman, R. (2002). Critical issues in developing and following community-based participatory research principles. In M. Minkler & N. Wallerstein (Eds), *Community-based participatory research in health* (pp. 556-573). San Francisco: Jossey Bass.
- Klineberg, S. (2005). *Public perceptions in remarkable times: Tracking change through 24 years of Houston surveys*. Houston, TX: Rice University, Department of Sociology.
- Kumpfer, K., & Alvarado, R. (2003). Family-strengthening approaches for the prevention of youth problem behaviors. *American Psychologist*, 58(6/7), 457-465.
- Lopez, M., Kreider, H., & Coffman, J. (2005). Intermediary organizations as capacity builders in family educational involvement. *Urban Education*, 40(1), 78-105.
- McDermott, D. (2006). Thinking mindfully about parenting and parenting education. *Child Welfare*, 85(5), 741-748.

- Moll, L., Amanti, C., Neff, D., & Gonzalez, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory into Practice*, 31, 132-141.
- Morrow, L., & Young, J. (1997). A family literacy program connecting school and home: Effects on attitude, motivation, and literacy achievement. *Journal of Educational Psychology*, 89(4), 736-742.
- Padrón, Y., Waxman, H., & Rivera, H. (2002). Issues in educating Hispanic students. *Yearbook of the National Society for the Study of Education*, 101(2), 66-88.
- President's Advisory Commission on Educational Excellence for Hispanic Americans. (2003). *From risk to opportunity: Fulfilling the educational needs of Hispanic Americans in the 21st century* (Final report). Washington, DC: Author.
- Resnick, M., Bearman, P.S., Blum, R.W., Bauman, K.E., Harris, K.M., & Jones, J. (1997). Protecting adolescents from harm. *Journal of the American Medical Association*, 278, 823-832.
- U.S. Department of Commerce. (1999). *Falling through the net III: Defining the digital divide*. Washington, DC: U.S. Department of Commerce, National Telecommunications and Information Administration.
- Wandersman, A., & Florin, P. (2003). Community interventions and effective prevention. *American Psychologist*, 58 (6/7), 441-448.