

Fishman, B., Kupperman, J., & Soloway, E. (1998). Introducing urban Latino families to the Internet at home: Preliminary issues and trends. In A. Bruckman, M. Guzdial, J. Kolodner, & A. Ram (Eds.), *International Conference on the Learning Sciences* (pp. 105-111). Atlanta, GA: AACE.

Introducing Urban Latino Families to the Internet at Home: Preliminary Issues and Trends

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Abstract: What happens when a community that has previously had very little or no exposure to the Internet receives Internet access at home? This paper describes a project that provided television set-top Internet access devices to Latino families as part of a project to link the school and home in an inquiry-based science curriculum. The early phases of adoption of the Internet and "NetTV" devices by families are described, with special attention paid to different ways families make educational use of the Internet.

This paper describes results from the early phases of a project that has introduced the Internet to urban Latino families with no previous Internet experience, as part of an effort to link science activities between the home and the classroom. For nearly two decades the Internet, and more recently the World Wide Web, has been touted as new media for learning with tremendous potential [Fishman, Hoadley, Harasim, Hsi, Levin, Linn, Pea, and Scardamalia 1997]. Most studies of Internet use for learning, however, have been limited to school settings [e.g., Gomez, Fishman and Pea in press] [Linn 1996]. Two notable exceptions are the Buddy Project [McMahon and Duffy 1993] and the HomeNet Project [Kraut, Scherlis, Mukhopadhyay, Manning and Kiesler 1996]. However, in most of this work, the populations under study do not represent a departure from the mainstream Internet users, who are generally white, well-educated, and of higher than average socio-economic status [Hoffman, Kalsbeek and Novak 1996]. In cases where different populations are addressed, it is typically through school-based activities. According to new studies, white and minority students have roughly equal access to the Internet in schools, but minorities have comparatively little access from the home [Hoffman and Novak 1998]. Available demographic data on Internet use only recently began reporting on race and ethnicity, and most commonly accepted statistics indicate that only a small percentage of Web users are Latino [e.g., Hoffman, Novak and Venkatesh 1997]. In addition, most data on who uses the Internet indicate a relationship to socio-economic status, especially in terms of education. While 76.6% of Latinos with a college education have some access to the Internet (either at home or in the office), that number drops to 16.3% for high school graduates and only 7.1% for those without a high school diploma [Wilhelm 1998]. Thus, while a growing number of students may be getting access to the Internet in schools, their families are not, and there is very little use of the Internet in lower-income Latino homes.

In the Spring of 1998, researchers from the Center for Highly Interactive Computing in Education (hi-ce) at the University of Michigan [1] provided a group of Latino families with access to the Internet through television set-top boxes (NetTV) [2]. This access was initially provided to help families participate in a science curriculum unit about the physiology of breathing. In this unit, the Internet was used for collecting and displaying data about lung capacity and environmental factors related to breathing. The entire family is asked to participate in these data collection activities and enter their data from home via the Internet.

A compelling advantage in selecting NetTV for families' Internet access (as opposed to full-fledged computers) is the fact that NetTV uses the family television set as its display, encouraging placement of the NetTV in the household's "public" spaces, such as living rooms or family rooms (though the actual placement of the NetTV devices was a choice made by individual families). We came to understand that in order for NetTV to be a viable medium for families to engage in school activity, they must also be encouraged to use it as an extension of their regular recreational or entertainment activities. Uses such as these, that extend far beyond the scope of our curriculum on breathing, may help to increase families' overall comfort level with the tools, thus preparing them to use it more naturally when engaged in curriculum-related activities.

[1] For information about hi-ce, please refer to <http://www.hi-ce.org/>.

[2] These set-top boxes are commonly called WebTV, which is a trademark of WebTV Networks and used by companies that market devices based on that network's standards. We are using set-top boxes manufactured by uniView, a WebTV competitor, and therefore will refer to these devices using the shorthand "NetTV".

Given the fact that these families are so new to the Internet, and that we have very little *a priori* sense of how they might make use of this technology, we began our investigation with the following questions: How is the Internet appropriated by these families? What kinds of things do they do, given access to email and the World Wide Web? Finally, in what ways do families use NetTV to enhance educational engagement, for either parents or children? These are crucial first questions to be answered in our ongoing efforts to establish new opportunities for learning among disadvantaged students and families who have not previously had access to new technologies.

Setting, Background, and Methods

This project was conducted in the Spring term of the 1997-98 school year, at a middle school in Detroit with a population roughly 60% African American and 40% Latino. Participants were the families of students enrolled in “ESL II Science,” a course designed for Spanish speakers with some proficiency in English, but not enough for regular English-language science classes. Many of the students’ families were seasonal workers, and the class size varied between 18 and 24 students. The class was officially at the seventh grade level, but students were placed in this class by language ability rather than age, and the class included students as young as 11 and as old as 14. During class time, the teacher spoke primarily in English, though he allowed the students to respond in Spanish. The majority of the students in the class were from Mexico, with some from Puerto Rico. Most of the students had moved to the United States with their families within the past several years, and the parents, for the most part, spoke only Spanish.

This was not the first time these students and their teacher had worked with our research group. The ESL II Science classroom as well as that of three other teachers in the school have been enacting science curricula designed by the hi-ce research group for the past year and a half. This was, however, our first interaction with any parents in this school. In December and January, the family of each student in the ESL II Science class was offered a NetTV set-top Internet box and a subscription to dial-up Internet services at no charge. A total of twenty families received set-top boxes. Some students did not have telephone service in their homes, and therefore did not receive a NetTV box; for those students, several NetTV boxes were made available in the during class time and after school “tutoring time” on Tuesdays and Thursdays. Two students in the class were brother and sister, and shared a single NetTV box at home. Families who received the NetTV boxes were visited by groups of Spanish-speaking graduate students from the University of Michigan who helped them to set-up the NetTV boxes and gave them an initial tour of its features. These same students kept in contact with families, both in person and over the phone, to support their use of the devices and to aid in troubleshooting. One member of our research team carried a pager so that families could reach him if they were having technical trouble, and he was paged frequently in the early stages of the project. The actual curriculum associated with the use of the NetTV boxes was started in late February, and ran until the end of the school year, with four one-week breaks due to vacations and standardized testing.

There were four data sources for this research: log files from the NetTV boxes, student interviews, field notes from the classroom and family visits, and records of group parent meetings. All families participating in this study signed research consent forms (translated into Spanish) indicating that they were aware that their NetTV use would be tracked using log files collected centrally by the manufacturer of the NetTV devices, and made available to us for interpretation. Due to timing issues (some students joined the program late in the semester), not all families received the NetTV boxes at the same time, and therefore we have valid data from only 13 of the NetTV boxes. These logs were valuable primarily for indicating when families used their NetTV boxes. Because the logs are collected from a central proxy server not controlled by the research team, it was not possible to use them to indicate particular web sites that families may or may not have visited. The student interviews were designed to provide information about the types of web sites visited, and the purposes for visiting them. We interviewed a total of fourteen of the students in the class [3]. Detailed field notes were kept by researchers who visited and called family members, and they provided qualitative data on how the NetTV boxes were being used by families and what kinds of questions people had about using them. Field notes were also taken during classroom observations, but these notes were designed to track the evolving design of the breathing curriculum more than the impact of the Internet on student learning. The final data source is notes taken at two group meetings with parents held in the latter half of the project. These meetings were designed in response to the initially low use of the NetTV boxes for completing classroom homework assignments, in order to solicit feedback on the design of the activity and to understand how family participation in these homework activities might be improved. These meetings were essentially focus groups, allowing us to probe parent attitudes and opinions on both the educational value they perceived for the Internet, as well as the role it might play in their household.

[3] Our intent was to interview all students in the class, but we could not due to time and access limitations.

Findings

Although we have learned a great deal about how the families in our project appropriated the Internet, we must emphasize the exploratory nature of this study. It is important not to over-generalize these findings from our population of twenty Latino families to the broader Latino-American population. Other complicating factors for these findings include the fact that many families had a shaky start-up period with NetTV box software that was not completely stable, necessitating a lot of initial troubleshooting. Nonetheless, we have informative data to report on what families did with the Internet, how they appropriated the Internet into their households, and how they used the Internet for educational activities.

Trends in NetTV Use by Families

An examination of log data from the NetTV boxes during the period from January 1, 1998, to May 8, 1998 reveals patterns of NetTV use that are sensible in light of our larger, qualitative view of family activity. Use was highest on weekends, but there was fairly consistent use of NetTV by families across days of the week [Figure 1].

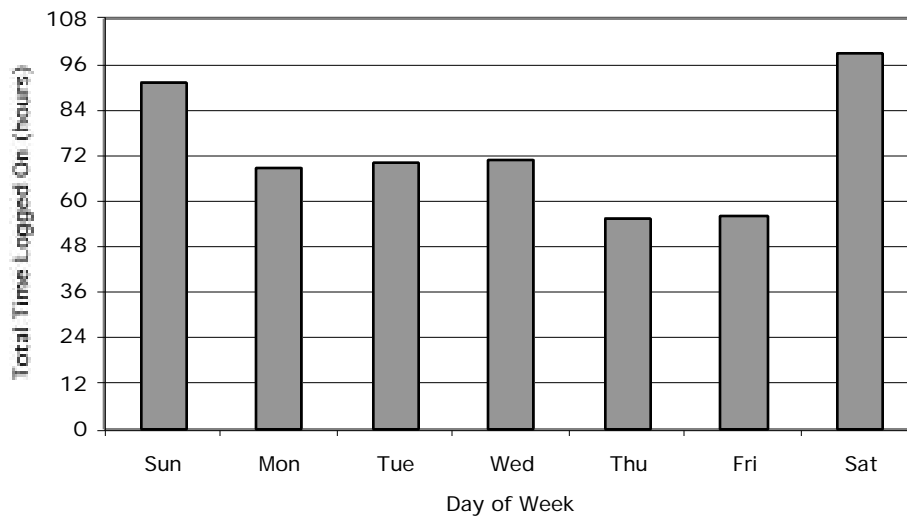


Figure 1: Amount of NetTV use (in hours) by all families by day of week.

During the week, nearly half of all NetTV use occurred in the after school and early evening hours, from 2pm to 8pm. The next most common log-on time was actually during the school day, from 8am to 2pm, accounting for just under a quarter of use. Although the school day was usually 8:05 to 2:15, several school week-long vacations and early dismissal days occurred during the project, which would account for use during this time period. On weekends, the majority of use occurred early in the day. A slight surprise was that nighttime log-ons (after 8pm) accounted for less than 10 percent of use both on weeknights and on weekends [Figure 2].

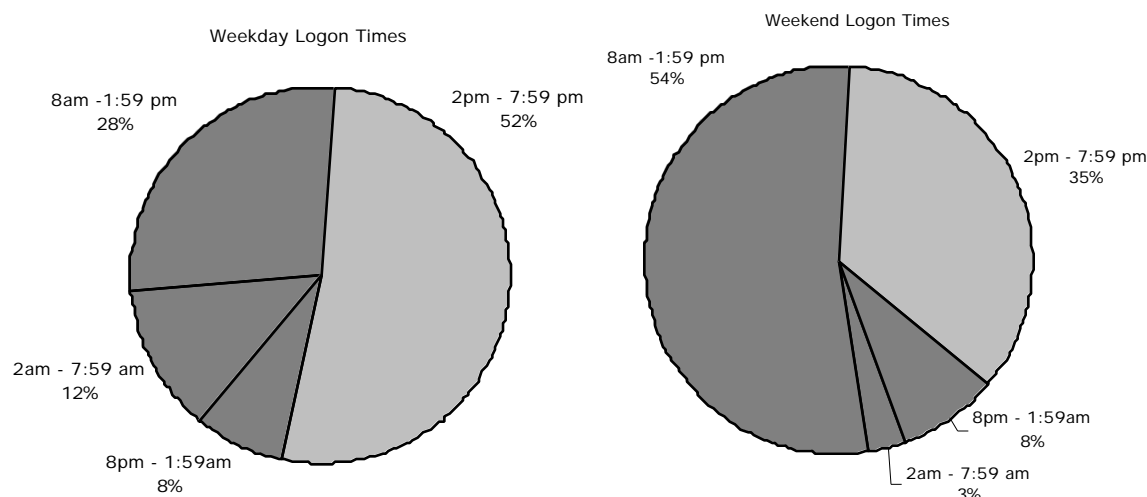


Figure 2: Times of weekday (left) and weekend (right) log-ons to NetTV.

The total amount that families used their NetTV boxes ranged from approximately 16 hours during the 128 days between January 1st and May 8th, to nearly 107 hours, though this was in a family (referred to below as “Family M”) that had two students enrolled in the ESL II Science class [Table 1]. The majority of families logged between 20 and 50 hours of NetTV usage during the study period. Two families used NetTV on only 13 days, and Family M used it on 71 days. On days when NetTV was used, relatively long sessions were common—most families logged on for 30 minutes or more on at least half the days they used NetTV. Use of e-mail was generally low—only family “M” accessed e-mail more than 11 times, and seven families accessed e-mail less than 6 times. However, our qualitative observations indicate that several students checked email more regularly using the NetTV boxes we had set up in their classroom.

Table 1: NetTV use by 13 families, Jan 1st to May 8th, 1998.

Family	Total time logged on (hour:min)	Total number of Web actions*	Days with at least one log-on	Days with over 30min log-on time	Number of log-ons with email activity
A	16:02	273	22	10	9
B	16:40	510	13	10	4
C	16:45	264	21	10	5
D	22:52	660	46	16	2
E	23:46	370	20	10	3
F	29:14	860	13	11	10
G	31:48	1028	26	17	10
H	35:32	507	33	13	1
I	40:40	697	25	17	1
J	47:00	1031	30	20	3
K	59:28	2742	23	18	9
L	66:31	2328	36	27	11
M**	106:59	1887	71	36	79

Notes: *Total commands to web browser, including “back” and clicks on hyperlinks. **Family M had two students enrolled in the project class.

Appropriation of NetTV by Participating Families

The prevailing attitudes of parents towards NetTV were a mix of anticipation and anxiety. The installation of the NetTV boxes was an “event” that most family members attended. People were reported to be excited at the prospect of making up their own usernames and email addresses. At one of the group meetings with parents, a father expressed gratitude that the university had provided computers for the homes, because “everything now is based on

computers,” and he went on to express this is a great opportunity for his community to get familiar with computers. Another parent said that computers help parents to get involved with their children’s activities, and there was general agreement that having access to computer and network resources from home was an advantage to their children, even if it was an unquantifiable advantage.

Several parents expressed apprehension about the NetTV box. This generally seemed to be not a fear of technology *per se*, but concern that they would be financially responsible if something happened to their NetTV box. One mother, for example, first said she didn’t want a unit because her family wouldn’t be able to pay for it if they broke it. Despite assurances that they would not be held accountable, some parents remained nervous about “borrowing” the NetTV.

Much of the NetTV use was by students alone, with siblings, or with friends, and to a lesser degree with parents. Some parents seemed to view NetTV as part of their children’s world, and approximately half of the NetTV boxes were installed in the student’s bedroom rather than a living or family room. An extreme example involved a student who used NetTV in her bedroom. When, in the middle of the semester, the family’s TV broke down, her TV was moved to the living room, but the NetTV box was not re-connected there. Instead, she had to arrange to borrow another TV before she could use NetTV again.

On the other hand, some parents showed significant involvement. Two students indicated that their fathers like to use the NetTV box to read newspapers, in particular papers from their home regions in Mexico. In conversations with a group of parents at one of the parent meetings, three of them indicated interest in using the NetTV to find information about events “back home.” Use of the NetTV box to gain information in Spanish and about familiar places seems like a natural fit for this community. Indeed, all of the families in this study have cable television, a “luxury” necessitated by the fact that it is the only way to receive Spanish-language television in Detroit. Several students reported involving their parents in their homework assignments (as was intended in the curriculum design of the breathing project). A majority of students reported either using the NetTV box with their siblings, or their siblings using the box by themselves, to look up recreational information about sports, television, and movies. One student reported surfing the web for fun with his brothers and father, and another was more specific about looking for information about cars and auto shows with his father. Although mothers were very active in the parent planning meetings, and were more vocal than the fathers about the value of the NetTV boxes to their children, they do not appear to have been active users of the NetTV boxes in the home.

Educational Uses of NetTV

During a home visit to one family, a parent commented that the entire reason he came to the U.S. was so that his children could study. His educational philosophy for his children is “*Si uno quiere, uno puede*” (“If one wants, one can.”) [4]. However, many parents realize that their children face additional challenges in this country as second-language learners, and in at least a third of the homes participating in this project, explicit mention was made of the parents’ own struggle to learn English, so they could participate more with their children’s learning. One parent commented, “I enjoy learning. My son tells me, ‘Mom, when are you going to learn English?’ [I tell him,] oh, son, I have to go to school.” Another mother said, “I keep going on with a lot of effort. It scares me to be more ignorant than my daughter, because the day when I know less than my daughter will be when I lose her respect and I don’t like that.” Set against this desire to be involved, however, are barriers to parents’ participation in their children’s learning, including the parent’s own lack of academic skills. One mother told us that parents don’t help their children with homework because they see it as “something separate.” “They tell their kids to go and do it, but don’t do it with them,” she said, implying a certain attitude toward one’s children’s schoolwork; but she continued, “It isn’t that it isn’t important to them, its just that many don’t know how to write or read.”

In our group meetings and in visits to homes, however, many parents showed interest in learning how the NetTV boxes could support their children’s learning. When setting up the NetTV in one home, one mother asked us to show her where her son “had to go” on-line to do his homework. Two other parents at one of the group meetings evaluated the on-line homework positively, stating that it was “less boring” than the usual homework their children bring home, and that doing homework together with their children provided a useful means for them to get to know about technology as a family. In interviews, 9 students indicated that doing homework on-line was “OK,” and 3 students stated that they “Love” doing homework on-line (out of a total of 14 students interviewed). However, only 8 indicated that they would be more likely to do their homework on- as opposed to off-line. Students explained that this was because they were afraid of losing their homework in a crash, though one student (who had a good

[4] All subject quotes are translated from Spanish to English. To save space, the original Spanish is not included.

understanding of networks) indicated that it was an advantage to have his homework on NetTV, because he could get access to it from anywhere and didn't have to worry about losing a piece of paper.

Although the predominant use of the NetTV technology was for recreational activity, there is evidence to suggest that it was used to support a broad range of educational activities. These include the homework that was assigned as part of science class, but more importantly, use went beyond those assignments to include other kinds of homework-related and educational activity. Most parents' comments about the purpose of NetTV characterized it as for their children's learning. This is not surprising, as the boxes arrived at their homes as part of a school-sponsored activity. Students in the project definitely saw the primary purpose of the NetTV box as for homework, or at least called attention to that fact when convenient—in a home where younger siblings expressed great interest in using the NetTV box to our visiting researcher, the student asserted loudly that she had first priority in using the box because it was intended for *her* to do *her* homework. During a visit to another family, a girl was upset because she was having trouble getting on-line and was afraid this would cause her to get a bad grade in the class.

Students found NetTV useful for homework beyond ESL II Science. In several visits, students told us that they used the NetTV boxes to do homework for other classes. In interviews, three students indicated that they used the NetTV box as part of their English and Reading classes, and one student reported that they had used it to do homework for social studies class. One girl reported "getting a URL from someone in school" to find a page that helps solve mathematics problems. Others tried to use the NetTV box to support homework—for example, looking up vocabulary words like "symbiosis"—but had trouble finding the information they needed. Other families also had trouble with Internet searching, which is a problem not limited to the NetTV technology but characteristic of Internet use in general [Wallace and Kupperman 1997].

Conclusion

The families that participated in this study are by no means proficient in the use of the Internet, but neither should we expect them to be after just five months. On the other hand, patterns of use and preferences for on-line activity are starting to emerge. Children (both students and their siblings), and to a lesser extent, fathers, were primary users of the uniView boxes. Mothers were very concerned that their children were making proper use of the boxes for school, but appear not to have used the boxes much themselves. Although education was not the predominant application for the NetTV boxes, students did access a broad range of educational resources using NetTV. This included using our own on-line curriculum materials, but also some self-directed web use in support of homework in other classes.

In addition to observations about the progress families made in coming to use the Internet, we have also learned a great deal about how to foster use among these "atypical" Internet users. In-home technical support, especially in the first several weeks and months of home use, was critical. The group meetings we held for parents were also important in giving people a chance to see how others were using their NetTV boxes, and to learn what was possible.

As a group, Latinos in the U.S. currently have less access to the Internet than other minorities, and far less access than the majority white population. Devices such as NetTV present an opportunity for new segments of the population to become involved in the on-line world, and linkages to schools are logical means for fostering family involvement. Our experiences in this one small community are an important first step to understanding the challenges that new classes of Internet users will face, and provides insight into how to turn these challenges into opportunities.

Acknowledgements

This work is supported in part by the National Science Foundation, the uniView Corporation, and the University of Michigan. Thanks to the administration, teachers, and families of the Detroit Public Schools for their enthusiastic participation, and also to our collaborators in the UM School of Public Health, Toby Citrin, Susan Morrel-Samuels and the membership of La Salud. Special thanks to Rigo Gallegos, who provided family support, and to Rosario Carrillo, who provided classroom support.

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