the Labyrinth

Sharing Information on Learning Technologies

Maricopa
Center for
Learning and
Instruction

The Changing Face of Students... Multiplied or Divided by Technology

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MCLI

We have likely all heard enough "Moore's Law" quotations (i.e. the information technology capacity doubles every 18 months) to drive home the impact of technology on education and society in general. And as members of the Maricopa family, we are well versed in our traditional role of meeting the evolving needs of our community.

What happens when the changing demographics of our student population, driven by the explosive population growth of metropolitan Phoenix, is compounded with the dizzying rate of change in technology--where Internet time compresses the old business cycles of innovate-refine-disseminate? How might we know the changing faces of students if we never meet face to face?

The promise of technology is to minimize the barriers of physical distance between people and cultures. By enabling these electronic connections, do the vast and fast reaches of information technology provide opportunities to appreciate and learn in a more culturally diverse world? It should! Before the Internet, I may have only learned about Icelandic, Korean, Kuwaiti, Chilean, Russian people from static print media— now I can immediately converse, exchange, and get to know them as persons and colleagues.

On the other hand, do the inequities of access to technology drive more of a wedge between the wired and non-wired? While recent surveys place Phoenix as one of the United States's most wired cities, with more than 50% of homes accessing the Internet, some local areas grossly lack the basic communication of plain old telephone service. The advent of "Free-PCs" may open more doors and make computer technology as common as television sets. Access to the electronic world may even be via our television sets.

In this issue of the *Labyrinth*, we probe different aspects of this complex combination of technology and diversity. Jack Clevenger describes how Mesa Community College is actively meeting the technology accessibility needs for students with disabilities, "not only because it is the law, because it is the right thing to do." Next, Dean of Instruction Ken C. Roberts shares the ways South Mountain Community College provides the diverse South Phoenix community access to campus technology resources. Then, Karen Schwalm provides a thoughtful overview about technology use with respect to age, ethnicity, and gender. Karen describes approaches taken by Glendale Community College to collect data from its networked computer resources and relates how this data can be used to direct interventions to address the needs of students that are using (or not using) technology resources.

Our correspondent from Egypt, Jon Lea Fimbres-Hetzel, illustrates a different view of cultural diversity she has seen as a minority Western visitor in the Middle East, where she is reminded "daily of the complexities of maintaining the balance of diversity and unity." Following this, we interview Angela Ambrosia to learn more about the changing face of distance learning students at Rio Salado College. Finally, Mary Jane Onnen tells us how LEE, a district developed CD-ROM program, is used to teach ESL and English courses for community members through a collaborative effort between the Dysart Unified School District and Glendale Community College.

These excellent articles by Maricopa faculty and staff clearly show the significant efforts we take to truly make *community* "our middle name." However, it can also seem we are only scratching the surface of something large and mysterious that is always transforming.

Paradoxically, technology seems to both multiply and divide the diversities of our world, our community.

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Information Access at Mesa Community College "Curb Cuts" to the Computer for Students with Disabilities

JACK
CLEVENGER
MCC

For years, Mesa Community College has made an ongoing commitment to provide *access*, *communication*, and *excellence* for each and every student enrolled for its classes. It has been especially committed to providing access, communication, and excellence for students with diverse needs and goals, whether it is students who are economically disadvantaged, students from a variety of ethnic backgrounds and nationalities, those who are academically challenged, or, students who have disabilities. Since this is an article about diversity, students with disabilities qualify as a classification of a diverse population of people with unique characteristics and norms. It is in this frame of discussion that we are addressing the need to be sensitive to the challenges they have at MCC. Mesa Community College is helping them meet their unique needs and enabling them reach their goals by identifying who they are and what their needs are. For students with disabilities, Mesa Community College is not only providing these students academic accommodations and specialized equipment because of the federal law (Section 504 of the Rehabilitation Act of 1973 and the ADA - Americans with Disabilities Act) but because IT is the right thing to do.

At Mesa Community College, there are over 700 students attending classes in the 98-99 academic year who have submitted documentation of disability in Disability Resources and Services. These students come with a variety of disabilities with a high percentage of them with learning disabilities (approximately 75%) and the rest with other disabilities. Almost all of them need to be able to access computer-based information to meet the requirements for their courses at MCC, and *this* is where the challenge begins *big time* for both the college and the students.

Imagine this scenario for yourself as a MCC student who has a disability:

Place yourself as a student at Mesa Community College who just found out that a course is based mostly on the computer such as CD-ROM or the Internet, and you have to do some extensive keyboarding. That is *hard* enough for a lot of students but, what if you happen to have a disability that limits your ability to access information from computers as well as do information processing in the "normal" way others can? Difficulties may be:

- inability or limited ability to read the computer monitor screen because of low vision/ blindness or a learning disability.

- inability or limited ability to keyboard because of limited mobility of the hands and fingers.

What are you going to do to access and gather information from computers to complete your work for the class? How are you going to turn in a paper that has to be typed when you have limited or no ability to do keyboarding because of a disability?

This *is* the big challenge faced by students with disabilities at Mesa Community College who have these difficulties using computers because of their limitations. How do *they* access information material from the computer-based sources to complete the requirements for a course as described above?

Before we get into ways that create access for the student with a disability, let's get into a little history about people with disabilities and computer access.

The phenomenon of computers and the Internet

With the advent of the computer and the Internet, never has so much information been available for all and at relatively little expense. This huge bank of information has been greatly facilitated with the birth of the home PC and the very popular Internet with all of its great potential. That same potential has been realized in the educational arena as institutions of higher education worldwide utilize the Internet for teaching its students the "tools of life." Consequently, the Internet has created new opportunities for learning in many ways that were not previously possible for students in colleges.

At the same time, the computer and the Internet has created a challenge for those with disabilities at Mesa Community College in their ability to access this tremendous source of information. The college is working as a whole to create equal access for its students with disabilities by proactively identifying who these students are, what their access needs are, and acquiring the necessary equipment. To do this, the following recommendations have been proposed:

Recommendations for selected accessible computer workstations at all computer centers at MCC and its Adapative Computer Lab

- (Information Commons, Computer Lab, Adaptive Computer Lab, Writing Center, classrooms with computers)

- Computers which have the speed, memory, and capability of handling special software applications
- Large ambidextrous trackball for those with limited dexterity and other adaptive computer gadgets and utilities
- 17" or larger monitor for those with limited vision or learning disabilities

Once we have the computer hardware needed to install special software applications, the following are examples that make it possible for the student with a disability to gather information from computer-based material:

For the student with low vision/blindness or who has a learning disability in the area of reading, Jaws for Windows will be available. This is an example of a screen reader software that reads in synthesized voice output the material which is on a computer screen. The student can "read" the information on the computer by listening to the voice output of the information on the screen.

They can also use LP for Windows if they have enough vision to make out letters but need to have them magnified. This is an example of screen magnification software on a computer that enlarges fonts or images on the monitor screen so a student with low vision can read or make out the images as desired.

Likewise, for students who have limited mobility or other disabilities that limit their ability to do keyboarding, Dragon Dictate Naturally Speaking can be used by students to process information on the computer by using their voice. Dragon Dictate is the leading voice recognition computer application that allows the student to use his/her voice to do the typing. This is very much like dictation to a tape recorder, only the words are being typed out on to the monitor screen by voice. The student would not have to do any keyboarding and would only need to use the mouse to follow the commands.

For the students who use Braille in reading, Duxbury for Windows is another application on the computer that translates text from the computer screen to Braille. Students proficient in reading Braille can use this to gather information and learn while completing their work for a class.

Ongoing work and efforts

However, providing the recommended hardware and software for computer access is only one part of the accessibility equation. Just as important as having the necessary computer applications and capabilities is having a knowledgeable, competent trained staff to assist those who need to use the adaptive applications and computers. MCC is making an ongoing effort to identify key personnel, provide training, and maintain efforts to keep its personnel up to date in assisting people with disabilities.

In addition, the Disability Resources & Services office of MCC has been actively involved in working with its computer advisory committees and personnel to identify needs and access concerns. This has especially happened in dialogue with the student webmasters who do most of the development of Internet courses for the instructors. Guidelines creating an accessible website are shared with the instructor's webmasters so that as Internet based courses are developed, the information can be accessed by the student with a disability. Those guidelines can be found at:

`http://w3.pwgsc.gc.ca/homepage/text/`
`w6acc-e.html`

In addition to the guidelines, an instructor's Internet course can be evaluated free of charge and approved for accessibility by BOBBY at:

`http://www.cast.org/bobby/bobbyfaq.html`

The whole arena of information access for students with disabilities has been such a new challenge that an Internet discussion forum has been created and made available for all to utilize for assistance and discussion. The source is *Equal Access for Software and Information* or EASI for short:

`http://www.rit.edu/~easi`

Publications and archives can be found at:

`http://www.rit.edu/~easi/pubs.html`

To summarize, Mesa Community College plans to have its computers accessible for students with disabilities across the campus within the next few months as it anticipates the completion of its new Integrated Library/Hi-Tech building by fall of 1999. Students with disabilities *will* be able to complete their course requirements without being restricted by limitations whether it is in the traditional class setting, Internet based/computer-based course, or at home.

In closing, ongoing efforts need to be made by everyone at Mesa Community College to create equal access to computer information and processing it for their classes. With the newness of the Internet and computer-based learning being so new, it is obvious that more work needs to be done to fully understand and implement computer accessibility for its students with disabilities. At Mesa Community College with its efforts to implement and practice its mission of *access*, *communication*, and *excellence* for its students, MCC is doing this not only because it is the law, because it is the right thing to do.

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Access to Technology: An Open Door Makes a Difference

KEN ROBERTS
SMCC

South Mountain Community College (SMCC) has, since its founding in 1978, served a highly diverse student and community population. Today, South Mountain is one of Arizona's two public institutions of higher learning that serves a predominately minority student population. The student population is composed of approximately 16 percent African American, 45 percent Hispanic, 4 percent Native American, 2 percent Asian, 21 percent White, with the remaining students unidentified. The distribution of the student demographics reflects fairly well on the general community make-up of South Phoenix. South Phoenix continues to have an unemployment rate approximately three times higher than that of the metro area. These statistics are expected to change significantly as housing developments begin to appear on former agricultural plots. Population growth of 54% is projected by the year 2005. SMCC also serves the growing communities of Ahwatukee/Foothills which are comprised of middle to upper middle class White residents. This community continues to expand in numbers, but the composition of the residents remains fairly constant, middle to upper middle class White.

SMCC has established outreach centers to serve the residents in several locations. The Guadalupe Learning Center, located in the Town of Guadalupe, serves a community with the lowest per capita income in Maricopa County. The new Espiritu / NFL Center located in south central Phoenix serves as an instructional location supporting a large population of residents whose primary language is Spanish. In addition, SMCC provides instruction at the Keys Community Center and the Neighborhood House located in east central Phoenix to serve the diverse population of residents who cannot travel to SMCC.

A community survey of the service area of SMCC conducted in 1998 by the Behavior Research Center indicated major differences in access to technology between the Ahwatukee / Foothills communities and the South Phoenix community. Seventy percent of the Ahwatukee / Foothills residents reported they have a personal computer at home, whereas only forty percent of the residents of South Phoenix have a personal computer at their home. Of the South Phoenix residents whose primary language is Spanish, less than twenty percent reported owning a home computer. These data indicate that for many residents served by SMCC the college must provide their access point to technology.

To those students lacking personal resources, SMCC must serve as the location for needed access to technology. Like all district colleges, technology has become common on campus. However, SMCC makes continuing efforts to broaden the availability and open access to computers for both students and community members. Many people who have had no experience using technology come to the campus with fears and misunderstandings. Faculty and staff are dedicated to guarantee that all technology users, especially the first time users, receive needed support and attention to ensure their ability to effectively utilize the resources available to them at SMCC and in the community.

Technology is no longer an 'add on' or 'supplement' to a quality instructional environment. Nearly every course taught at SMCC, much like the District as a whole, has some form of technology support or resource to facilitate the learning agenda. If the technology is not directly present in the classroom, it is used by students in the lab, the library, or the learning center. Textbooks commonly contain web addresses to support textual materials. CD ROMs are standard supplements to the textbook. Access to, and the ability to effectively use technology, is tightly integrated with effective student learning. In an article in *Change*, Kenneth Green indicated that between 1994 and 1995 the percent of college courses using technology in one form or another nearly doubled. He further indicates that data reflecting the use of technology in a collegiate environment is finally breaking past the innovators and early adopters and into the ranks of mainstream faculty across disciplines.

The faculty and staff at SMCC are committed to providing the highest quality instruction and services to the diversified population of students. The integration of technology into both instruction and student services is a core value of the college. However, due to the economic conditions, it is critical that the college not only provides technology support to enrolled students but also to the diversified members of the community. SMCC strives to provide this access to technology for both of these groups.

The SMCC library is active in inviting community members to obtain a Community Borrower's Card that provides open access to computers and other resources within the library. This Community Borrower's Card is issued to young people in elementary school, to high school students, as well as to any community member. The card provides access to on-line catalog materials including books, videos, audiocassettes, the Internet and inter-library loans. Beyond mechanical access, community borrowers receive training and support from the faculty

librarians and staff members. Community members make heavy use of the library and related technology. It is not uncommon to find young students, elementary and high school age, in the SMCC library completing homework assignments on a computer. Nor is it uncommon to find senior citizens accessing the Internet and using available computers to enhance personal interests.

The Learning Assistance Center also honors the Community Borrower's Card issued by the library to provide access to computers. Using the card, community members can access a range of software and video tutorials as well as use computers for word processing. Numerous area residents take advantage of this opportunity to use word processing software in creating or updating resumes and have secured employment as a result. In addition, the card insures community members have a location for Internet and E-mail access. All of these efforts are supported by training and assistance provided by the LAC staff.

The Early Outreach program at SMCC provides opportunities for access to technology outside of the elementary school environment to children in our immediate service area. The majority of the children who come to the Early Outreach program do have access to some type of computer at their local school. For many of the children the time spent on a school computer averages about 35 minutes a day three times a week, and most of this time is spend on skill building. Access to computers at SMCC provides opportunities for young students to explore the use of technology, complete homework, and refine computer skills. The Early Outreach program assists young children in learning how to use the technology available in the library to complete school assignments. These students are shown how to use the on-line catalog, search the web, and use a word processing program for writing a report. The library also maintains a diverse collection of CD-ROMs for children. Access to this level of technology for children in grades 1 to 8 serves as a great equalizer.

In a similar manner, the Open Computer Lab at the college also provides access to community members on a space available basis. The lab serves many people whose primary language is Spanish. Also, it serves senior citizens and young students. University students who live in the SMCC service area are also frequent users of the Open Computer Lab. Small business owners in the area benefit from the open door policy as they occasionally utilize the lab to create flyers, mailers, or promotional literature. Staff in the lab are available to provide support as needed by these users.

Efforts have been made to establish computer access points at a number of locations on campus. The Dynamic Learning Program, which prepares students for transfer into the ASU College of Education, has a dedicated lab to support the students. When the lab is not being used for instructional purposes, students can use the computers to complete homework, do assignments and access the Internet. This lab is extensively used since the great majority of the students do not have access to technology except for that which is provided by SMCC. Also, community partners who assist our Dynamic Learning students are frequently found in the lab working with our students and often accessing the Internet for their personal use. In a similar manner, the Mathematics, Science and Engineering Division has developed several small computer labs which are open for student use. These labs provide student access to technology outside of formal classroom or laboratory instructional periods.

The Continuing Education program at SMCC is based in many neighborhood settings. SMCC offers a range of courses at two high schools locations in the Ahwatukee/Foothills communities. In the South Phoenix community, classes are offered at a number of locations and have a strong focus on technology. At the Neighborhood House and the Espiritu/NFL Center, introductory computer and software use courses are offered in both credit and non-credit versions. When residents complete one of these introductory courses, they then have access on an as available basis to the computers at these locations. This approach insures that community members have the fundamental skills needed to use the equipment and have access to it. At the Keys Community Center SMCC has offered basic computer classes to center participants. These offerings are coordinated with job preparation programs offered by the City of Phoenix.

Generating opportunities for growth and development through easily accessible technology programs for the diversified community population fulfills an important part of SMCC's mission. This emphasis on technology results in better preparing students to be competitive in their continuing education at the university level or in the job market by providing contemporary computer skills. In fact, all members of the community; senior citizens, parents, and children, benefit from enhanced technology skills that are put to use at work, school, or in public access systems.

South Mountain Community College is committed to providing broad and readily available access to technology for enrolled students and community members. Access plays a key role in the college's technology planning and has been a pivotal discussion topic of the SMCC Ocotillo group. Faculty and staff are working to insure that all students, and community members, can find both the technology and the support needed for them to prepare and function in a technological society. Students and community members alike are appreciative of the impressive technology made available to them. Increased comfort level in using technology and higher grades on school projects are frequent comments made regarding the programs. As new buildings are added, and new equipment purchased, access will remain a central value at South Mountain Community College.

Diversity and Technology

KAREN
SCHWALM
GCC

As we invest more heavily in our technology infrastructure and integrate computing more fully into the learning activities of our institutions, it behooves us to check periodically that we are building an equitable learning environment which serves all our students. This is especially important as we attempt to recruit a more diverse student population. We want to make sure that we do not add technology as a barrier to education with other exisiting barriers to education, and that we do not just assume that barriers to technology no longer exist because technological talk seems so common in our everyday conversations. I am not arguing that technology in education is inevitable, but rather that as its use becomes more widespread, we pay close attention to those who may be displaced by its use. We must institute policies and practices to redress those inequities, and increase the comfort all students have in the high-tech environment in which they study, work and live.

I am not suggesting that any of our institutions intentionally create barriers to technology use by specific groups of students, but until we build mechanisms to analyze the use of our networks and computing facilities, it is dangerous to assume that de facto inequities aren't appearing. These mechanisms need be neither intrusive nor expensive. Basically, I am arguing that we establish the capability to answer a single baseline quantitative question: Are there any statistically significant differences in age, ethnicity, and gender that appear in conjunction with access to and general use of our computing facilities? We all believe and hope that the answer to this question is "no," but I contend it is dangerous to make that assumption without corroborating data.

Obviously, people use technology in different ways, for different purposes, and at different frequencies. Colleges and departments certainly vary in their commitment to and emphasis upon the use of computing. For example, we might expect to see differences in technology use according to academic discipline, or between students in transfer and occupational programs, or according to learning style or number of hours enrolled. Looking at institution-wide technology use, however, we could expect these differences to spread themselves equally across our student population, especially at colleges with large enrollments, significant technology installations, varied programs, and diverse populations. If they don't, we ought to investigate further. The results of such investigations may lead to changes in budgeting decisions, computing policies or instructional practices that may produce increases in our institutional effectiveness.

Why is this question important?

Researchers have identified a number of social and economic reasons why minority students and girls leave the secondary schools with less computer experience than non-minority students and boys. Issues of access dominate. Students build their expertise by spending regular and extensive time on computers, so the ratio of students to computers is critical. While many schools have inadequate numbers of classroom computers, minority students and girls are less likely to have alternative access points, either at home or in public libraries where they can supplement the computer time provided at school. In schools, more aggressive students are likely to monopolize computer use, especially as they outstrip other students in demonstrating their computer competence. Sophisticated computer use, especially of wide-area networks like the Internet, is often reserved for those students who get better grades, who are more resourceful, more independent, and more affluent. Because minorities are over-represented among those with lower socio-economic status, the ability to purchase computers for sustained personal use at home is not equitably distributed across society.

A number of cultural issues affect students' ability to develop extensive computer expertise. In the past, instruction in computing has frequently been linked to math and science instruction; if minority students and girls proceed more slowly in these content areas, they will also proceed more slowly in developing computer skills. In fact, the kinds of computing activities available in the past for students have fallen into a restricted range, one tied more closely to majority culture than to the interests of members of minority groups. In addition, in most computer labs, few mentors and role models exist for minority students and for girls. Finally, many teachers view computing hierarchically, reserving it for those students who have mastered other skills perceived as more "basic." Consequently, minority students especially, over their secondary school careers, may not develop equivalent levels of computer competence as their non-minority peers, and girls may be assumed to have achieved computer competence when they have really only demonstrated keyboarding skills.

When minority students and women enter college with less computer experience (whether they are coming directly from the secondary schools or from the workforce), they can feel the effects almost immediately. Any perceived inadequacy, whether it is in preparation, experience, or skill level, contributes to the ease with which students are willing to drop out.

Differing levels of computer experience have measurable effects on students' ability to complete assigned work in a timely and efficient manner. Students with well-developed computer skills know how to use various productivity tools like spreadsheets, databases, and word processors, and recognize their benefits. In addition, they may

know how to use the Internet to retrieve up-to-date or obscure information. Students who neither have access to the tools nor have prior experience using them may spend their available time doing mechanical tasks manually, running out of time (and energy) before they get to more intellectually rewarding activities. Lack of computer experience, especially with networked resources, may close off opportunities for developing improved literacy skills, and lack of familiarity with computer environments may hamper minority students and women when they encounter technologically-rich educational activities like simulations. In addition to inhibiting students' academic success, lack of computer experience can close off opportunities for career development, and thus restrict minority students' and women's chances of long-term economic success.

What can we do?

All institutions of higher education, but especially community colleges, have the responsibilities for fostering increased educational access and for ensuring opportunities for success for all students. In part, we can do this by encouraging students to increase their level of computer expertise. First, we must provide extensive computing facilities and a variety of user environments so that all students can gain easy access to technology and learn in a hospitable and safe climate. Second, computing activities must be linked with activities across instructional levels and throughout the curriculum, so that lack of progress in one academic area does not preclude the development of computing expertise. In addition, providing different kinds of computer-mediated environments may privilege different kinds of learning skills demonstrated by students with a variety of cultural backgrounds. Colleges must provide a variety of computer-mediated communication opportunities, especially ones that take into account backgrounds in oral culture, so that students can enhance their own literacy skills by reading and writing on topics that relate to their own interests and heritage. Finally, colleges must seek out minority and female teachers, tutors, and assistants to work in computer environments where they are visible and accessible to all students.

How can we measure our progress?

As we become interested in questions of this nature, and consider shifts in our policies and practices, we ought to have some way of measuring the impact of changes we might implement. To this end, Glendale Community College, in conjunction with the re-design of our academic network, has developed a number of quantitative measures that are helping us examine student use of our network; this regular analysis continues to remind us that we should be concerned about any differences in network use we encounter. Here are the initial questions we are asking each semester:

1. Does the demographic makeup of students who have computer accounts match the demographic makeup of the college as a whole? To take into account the fact that there may be correlations between gender, ethnicity, age and full or part-time status, we are currently comparing the duplicated enrollment (number of students x number of courses they are taking) with a duplicated number of accounts (number of students x number of courses for which network accounts were created).

For example, during Spring, 1998, the first semester for which we have data, only 17% of our students had computer access to our new network linked to the courses in which they were enrolled. American Indians represented 2% of the enrollments in our courses, and this group accounted for 2% of our network accounts. However, Asian students represented 5% of the enrollments and 7% of our network accounts. Ideally, demographics of access to the network should match the demographics of our enrollment.

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http://gecko.gc.maricopa.edu/Palette/
       Diversity/Spring1998.htm
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This should also be true with to respect to gender. However, in Spring, 1998, women made up 54% of our course enrollments, but they represented only 47% of our network accounts. Men accounted for 42% of our enrollment, but they represented 51% of our network accounts. Given the small proportion of students with access to our network, this discrepancy was cause for concern.

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http://gecko.gc.maricopa.edu/Palette/
       Diversity/Spring1998.htm
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In Fall, 1998, these numbers changed. The number of students with access to the new network almost doubled to 31% of the course enrollments. American Indians still represented 2% of the enrollments and 2% of our network accounts. However, Asian and Black students each represented 4% of our enrollments and 5% of our accounts.

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http://gecko.gc.maricopa.edu/Palette/
       Diversity/Fall1998.htm
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With respect to gender, a significant shift occurred during the Fall. Women represented 55% of our enrollments but accounted for 59% of our network accounts. Men represented 44% of course enrollments but only 40% of network accounts.

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http://gecko.gc.maricopa.edu/Palette/
       Diversity/Fall1998.htm
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At the moment, not all GCC students actually have computer accounts, so this measure is important. It probably reflects as much the diversity of the programs that have made the move to our new network as it does anything else. However, when we institute universal access beginning with Summer, 1999, this measure will become moot. At that time, all students will have computer accounts by virtue of their enrollment at the college, and there will be no difference between enrollment in the college and access to computing. Other measures will then come into play.

http://www.mcli.dist.maricopa.edu/labyforum/

2. Does the proportion of students who use their computer accounts match the proportion of students who have them?

For example, during Spring, 1998, 57% of all students who had computer accounts actually used them. This means they logged in at least once, a very minimalist measure of "use" to be sure. In Fall, 1998, these numbers changed. Approximately 61% of all GCC students who had network accounts used them.

However, these numbers varied by ethnicity. Spring semester, more than 69% of Asian students used their accounts, yet only 48% of Black students did so. During Fall, 1998, the numbers still varied according to ethnicity, but not nearly as much as they did the previous semester. For example, 69% of Asian students used their accounts, and the percent of Black students using theirs had climbed to 65%. Obviously, if we want to integrate technology use into instruction effectively, we need to know how many of our students actually access their accounts, and then whether they access them on a regular basis.

With respect to gender, during Spring, 1998, 57% of all women who had accounts used them; 58% of men did so. However, only 48% of Black women used their accounts while 58% of Black men did so. This was the first indication that technology use may differ by gender and ethnicity.

During the following semester (Fall, 1998), among all ethnic groups, men continued to be more likely to use their computer accounts than women. For example, among Blacks, 57% of the women who had accounts used them, but 74% of the men had used theirs. This trend is disturbing.

With respect to gender, the discrepancy between those who had access to our network and those who actually used it widened in Fall semester. For instance, 57% of women who had accounts actually logged into them at least once, while the same was true for 66% of men. When we segregate the figures, the gap grows. For instance, among Asian students, 64% of the women accessed their accounts; 74% of the men did so. Among Blacks, 57% of the women used their accounts while 74% of the men did. We will know more after the 45th day data are in this semester to see if this disturbing trend continues.

Meaningful access goes further than just providing accounts for students; what matters first is if they use the accounts, then how regularly, and finally to what ends. There is much more analysis that can be done here. Last semester we looked for the first time at the ethnicity and gender of those students who used our on-campus computing facilities, and this year we will look at the demographics of those who access from off-site. It may be that we should develop strategies to encourage those with connections from home to use them in order to free up on-campus resources for those who do not have alternative access.

3. Mentoring is an important element in developing comfort with technology. While in its more active definition, mentoring implies a close and continuing series of interactions between students and teachers or employers, a more casual and distant relationship can have equivalent power. We must pay close attention to the hiring practices in our labs, making sure that we have both women and men among our employees, that they come to computing with a wide range of technology experiences (not just computer science, programming, or science) and that they reflect the ethnic and age diversity of our campuses. At GCC we have tracked a change in the demographics of our employees that parallels a change in the kinds of technology applications available in our campus computing facilities. Our employees now resemble more closely the demographics of our student population than they did in the past.

Continuing Research

This preliminary look at the data has revealed one important finding. If we conflate ethnicity and gender, we may mask some important differences in technology use. It is critical to look at these two dimensions separately. It seems that gender may be a more persistent barrier to technology use than ethnicity. At GCC we haven't looked closely at age as a factor in technology use; such differences, if they appear, may suggest changes in campus recruitment strategies, orientation programs, and instructional strategies.

This data will have a significant effect on advice we offer instructors: about how much they can rely on electronic means for communicating with students; about the interval they might need to allow for networked assignments; about developing strategies for encouraging women and minorities to become comfortable using technology.

If technology continues to play a significant role in higher education and if we maintain our commitment to educational equity, expanded access, and instructional activities enriched by technology, we must pay at least minimal attention to who uses our networks, how often, and for how long. If we design with these questions in mind, we can make our technological resources go further in promoting educational equity and the development of a more democratic society.

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Unity Within Diversity

*Jon Lea Fimbres-Hetzel, former PVCC faculty member, is currently Regional Educational Advising Coordinator of the Middle East and North Africa and a humble learner. [*jonfbobh@internetegypt.com*]*

JON LEA
FIMBRES-
HETZEL
CAIRO,
EGYPT

Strangers at home cannot be at home in the world. Least of all should we see a contrast between our liberal individualistic tradition and the desire for the unity of mankind.

Everyone who works on himself opens the door to humanity, and whoever cares for humanity enters deeper into self, and thus helps to balance the ambivalence that has been part of man through the centuries.
Robert Ulich, *Education and the Idea of Mankind*, 1964, The Council for the Study of Mankind.

"Maintaining unity while honoring diversity' used to be on every one of my final exams," said my friend who grew up in India. "The most gentle of all Arabs are the Egyptians," clarified a Middle Eastern colleague who was explaining why she likes living in Egypt. As Robert Ulich's quote indicates, the struggle to balance identity with unity has been around a long time. This is not a new issue. It is only more evident because of the global economy, access to media internationally, and the increasing mobility of many people.

My move from the United States has changed my perspective on diversity. I have come to see diversity as a much more complex issue than racial or cultural balance. I quickly learned that all Muslims were not alike; that all Christians do not share identical beliefs; and that Egyptians who lived through the Nasser years may have different values than Egyptians living in the Mubarak era.

The greatest challenge in addressing the increase in diversity throughout the world is acknowledging and appreciating our differences while finding respectful ways to maintain our human communities through compassion and integrity.

"Unity within diversity" is easier said than done.

Living in the Middle East and working through a global network of international educators reminds me daily of the complexities of maintaining the balance of diversity and unity. On a regional level it has been interesting to learn about the diversity among Arabs. Many in the United States would like to regard all Arabs as one people. There are many values that peoples from the various Arab countries share, i.e. a strong identity with family and a common language. However, each Arab country has its own national culture and very unique outlook on life. A Kuwaiti student might have very different values and lifestyle than an Egyptian student.

Sometimes what may seem a very unified group may have surprising diversity. Teaching and training in Egypt has been a very eye-opening experience when one considers the diversity among Egyptians. As an American I was gently reminded that my life experience and view of the world is only one possibility. As I faced what might seem like a homogeneous group of male, Egyptian ESL students, I learned about the subtleties of diversity. I had Bedouins, Europeans, Nubians, Coptic

Christians, Muslims, literate, illiterate, rural and city dwellers in my class. Some of the biggest differences had to do with socio-economics. Accommodating all of these life experiences was challenging. For example, as we learned about the family, I was reminded that some men in this group, are not permitted to use their wife's name in public. Since they were from a relatively conservative and traditional background, there were certain discussions that were not appropriate. Although the men might leave the class holding hands, as their female teacher I had to be very careful about my dress and avoid any physical contact.

By working with what each student has in common, a very diverse group can achieve unity and understanding. Recently, I organized a regional workshop for higher education advisers. Our diversity allowed us to have many perspectives and expanded our views of our students and education. The advisers were from Egypt, United Arab Emirates, Ukraine, Holland, Singapore, Sudan, Syria, and Arizona. Because of our common experience as overseas educational advisers, we had many interests, values, and goals in common. In an atmosphere of respect, each person was willing to share their culture and provide feedback about what they needed in order to learn effectively. Additionally, all were willing to move out of their comfort zones to accommodate other advisers in the group. Since most of us had experience being a minority, foreigner or novice, each person understood the value of accommodating differences and cultivating patience with the learning process.

Although some would argue that homogeneous groups are more efficient and valuable, one must realize this is no longer the real world. What I have noticed overseas is the more a person has to deal with diversity in equitable situations, the person's outlook is broadened, their communication skills are enhanced, and their mutual respect for one another increases. In a learning situation, although it may sometimes take longer to process information and dialogue, the outcome is better.

Equitable treatment is one of the keys to balancing diversity and unity. In an atmosphere of mutual respect, each person can express their uniqueness while identifying with something larger than their tribe, race or family. They can identify with what they have in common as learners and citizens of the world.

I was seeing in a sacred manner the shapes of all things in the spirit, and the shape of all shapes as they must live together, like one being. And I saw that the sacred hoop of my people was one of many hoops that made one circle, wide as daylight and as starlight, and in the center grew one mightily flowering tree to shelter all the children of one mother and one father.
Black Elk. *Black Elk Speaks.* University of Nebraska Press, Niehardt, 1972.

LEE: A Valuable Addition to Language Learning

MARY JANE ONNEN
GCC

Learning English Electronically
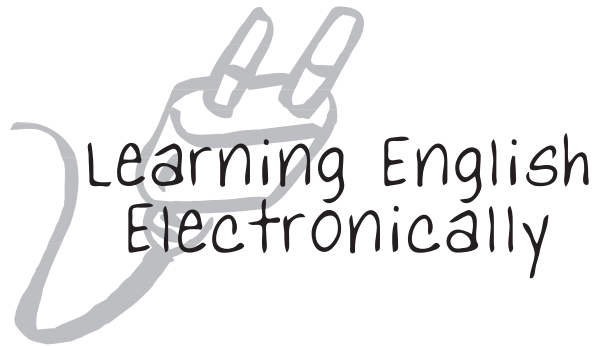
The Maricopa Community College District reaches thousands of students across the valley, yet there are still thousands that may never take a college class. Some may not have any interest and, for those who do, the cost and distance may be obstacles. For one group of potential students, Hispanic immigrants, language is a major barrier. Before they can finish a certificate or degree program, they must improve their English proficiency. English as a Second Language (ESL) classes are an essential starting point for their education. Often, these newcomers congregate in rural areas far from community colleges and do not have the opportunity or the means to take advantage of the many ESL classes offered in the community college system.

However, these impediments of cost, language, and distance were overcome through a collaborative effort between the Dysart Unified School District and Glendale Community College. Five years ago, the Bilingual Department in the Dysart Unified School District identified a need for English as a Second Language classes for the parents of the bilingual children in their district. Bilingual Department Director, Marilyn Sanchez, had obtained funding from a Title VII grant to improve the academic achievement of children with limited English ability. Recognizing the key role of parents in a child's education, Ms. Sanchez had set aside funding to pay for tuition and book expenses for ESL education of these parents. In addition to paying for classes, childcare was arranged and the classroom space was located in one of the elementary schools. Glendale Community College provided testing and registration sessions at the elementary school, and the first classes began in January 1994.

Having the ESL classes off-site allowed the parents to receive the same classes offered at Glendale Community College in a more convenient and non-threatening setting. Faculty from Glendale Community College offered classes in English as a Second Language and reading. As completely as possible, instruction and services at El Mirage Elementary School matched instruction and services at the college. Of course, it was impossible to provide everything that Glendale Community College offered. Computers were available in El Mirage School, but the software on the computers was geared to elementary students. Except for a typing tutorial and word-processing program, there was no software to support the English as a Second Language instruction. The Learning Assistance Center with its ESL software on campus could not be duplicated off campus. Dysart students had the option as registered students to work in the Learning Assistance Center at Glendale Community College, but none chose to do so.

Then, in May 1998, the Learning English Electronically program (LEE) developed by the Maricopa Center for Learning and Instruction (MCLI), and ESL faculty became available in a CD-ROM format. At last, not only did the students have the opportunity to work on computers, but they also had meaningful activities to use. LEE is a computer-based educational program designed primarily for English as a Second Language (ESL) instruction. The goal of LEE is to help adults with a moderate level of proficiency in English recognize the structural patterns of the English language and develop their writing skills at the sentence level.

LEE is organized in units that cover 22 different grammar concepts. Because of its wide range of grammar concepts, the software may be used at different levels of instruction. For the three levels of ESL classes in El Mirage, it was possible for each class to find a unit to complement instruction in the classroom. A classroom copy of the LEE CD-ROM was kept in the El Mirage computer lab, and a schedule was set up so that each class could have an hour of computer instruction each week. Students could use LEE for grammar practice and also for vocabulary enrichment. Within each lesson it was also possible to read and listen to a text. This was a popular feature for improving listening comprehension and pronunciation.

Because the LEE CD-ROM was inexpensive, several students purchased their own copies. They were very pleased to find that it was easy to use, and often the whole family would share the software.

The real test for the LEE program came in the fall 1998 semester. So many students had registered in August 1998 that an additional section of ESL had to be opened the week before the semester began. However, all the available classroom space was filled. The past four years two teacher workrooms, the art room and the library in the elementary school had been used, for the classrooms built for elementary students were not comfortable for

Bag of URLs

MCLI collects relevant web sites to share with you in our "Bag of URLs":

> http://www.mcli.dist.maricopa.edu/eye/bag/

This site offers you features to search among more than 1400 items already submitted, a place for you to "drop" more URLs in the "bag," and an e-mail list to sign up so you can receive notices when the most recent bag has been updated.

Below are a few sites that address the diversity/changing faces of students theme of this issue. We encourage you to share more related sites.

Maricopa Web Sites

Diversity at Maricopa Community Colleges: Through its Governing Board, Maricopa has established Diversity as an institutional value. This site provides links to related sites within Maricopa and some general information and links to external sites.

> http://www.maricopa.edu/diversity/

Diversity Training Project: Maricopa's Employee & Organizational Learning Team (EOLT) provides diversity orientations to new employees as well as training to all existing employees.

> http://www.dist.maricopa.edu/learn/
> programs/diversity/

Maricopa Student Profiles: this site shows a portion of the Maricopa Information Update that gives a statistical picture of a Maricopa student.

> http://www.maricopa.edu/information/student.html

One Connected Day in Maricopa: The coffee table book "One Connected Day" included images collected in a 24-hour time period that documented the role that computer microchips affected people from around the world. Following this idea, this site documents one such day at Maricopa, describing the ways students in our system use technology.

> http://www.maricopa.edu/connect/

Other Web Sites

DiversityWeb: "links Colleges and Universities that are working to engage the diversity of United States society in educational mission, campus climate, curriculum focus and connections with the larger society."

> http://www.inform.umd.edu/diversityweb

Diversity Digest: is a quarterly newsletter that provides practitioners with readily available information about successful diversity initiatives around the country.

> http://www.inform.umd.edu/diversityweb/Digest/

Diversity Resources: Teachers looking for ways to incorporate more diversity into their curricula can browse through this extensive list of resources.

> http://www.execpc.com/~dboals/
> diversit.html

Diversity at Fisher College of Business: this site at Ohio State University presents a wealth of information and a comprehensive bibliography on diversity.

> http://www.cob.ohio-state.edu/
> ~diversity/

Multicultural Pavilion: a comprehensive site from the University of Virginia that addresses the issues of transforming education to be truly multicultural: "It is a movement which calls for new attitudes, new approaches, and a new dedication to laying the foundation for the transformation of society."

> http://curry.edschool.virginia.edu/go/
> multicultural/home.html

Y? National Forum on People's Differences: a forum established to address and discuss the sensitive issues that divide people.

> http://www.yforum.com/

Association of American Colleges and Universities: has as one of its priorities establishing diversity as an educational and civic priority.

> http://www.aacu-edu.org/Initiatives/
> priority4.html

Center for Applied Special Technology (CAST): "expands opportunities for individuals with disabilities through the development of and innovative uses of technology....through research, product development, and work in schools and educational settings that further universal design for learning." This is the home of Bobby, the web tool that analyzes web pages for their accessibility to people with disabilities.

> http://www.cast.org/

Web Accessibility Initiative (WAI): a branch of the W3C Consortium (the international body that ratifies the HTML standards) that is promoting a high degree of usability for people with disabilities.

> http://www.w3.org/WAI

Equal Access to Software and Information (EASI): a resource for information and guidance in the area of access-to-information technologies by individuals with disabilities.

> http://www.rit.edu/~easi/

The Changing Face of Distance Learning Students
Interview with Angela Ambrosia, RSC, 2/17/99

ALAN LEVINE
MCLI

Note: The audio version of this interview is available in Real Audio format from the Labyrinth/Forum web site.

AL: **Angela, what is your title at Rio Salado College?**

AA: I am the faculty chair for Computer Information Systems as well as the technology liaison for course development.

AL: **Could you share your background and how you came to these positions?**

AA: I think I am the "jack of all trades, and the master of none!" I have master degrees in Computer Science, Medical Biology Education, as well as an MBA, plus a Ph.D. in Health Management. I am still learning and taking courses.

AL: **When we first met, you were teaching at Phoenix College and doing some experimental distance learning.**

AA: Yes, we were using Electronic Forum, the bulletin board system developed at Glendale Community College, and we started developing materials delivered via Mosaic, the first graphical web browser.

AL: **How would you describe some of those first experiences for students? What types of students were taking those classes?**

AA: I think they were the same students with the same needs that we serve now. These students are torn between work, family, and school. These demands consume their schedules, and they try to maximize their time in each. The students are saying, "How can I learn when it is most convenient for me?" When they are doing their courses at home, they have combined learning time with their family time.

AL: **So you went from a handful of experimental courses to how many students served now at Rio?**

AA: Right now we start classes every two weeks in our distance learning program. And we've had two starts this year. Already we have over 3300 students, an increase of 29% from the same time last semester.

AL: **Would you say the students coming to you are more diverse than the ones you saw 10 years ago?**

AA: Absolutely. My first students were young students, ones who were exposed to technology at an earlier age, but now it seems like everyone knows about the web. My oldest student is 83 years old, and my youngest one is 14. I have students who were home-schooled, so their parents feel the natural extension for college is distance learning. These students are already self-motivated; they have finished high school in that type of environment.

AL: **Your description seems to indicate a range of interest and abilities in students who are coming to you. What kinds of things do you use in the beginning to evaluate and advise the distance learning student?**

AA: Students take our courses because they need them; they choose the modality that is comfortable. Our advisors provide great information to help students determine if they have the time, skills, and habits to succeed in this format. We want to avoid setting up students for failure, so if they are already working say 50 or 60 hours a week, they likely do not have sufficient time to study. I advise students to take one course at a time and finish it before starting the next. Since we start every two weeks, there is plenty of opportunity to sign up when it is the right time.

Right now, one of our challenges is with our financial aid system. Students must enroll for a full semester load to get aid. Immediately, students are primed to sign up for five classes. The aid is doled out via an antiquated semester schedule. This creates a great deal of pressure.

AL: **How can distance learning reach more diverse students?**

AA: For some of my disabled students the only way they can take classes is via distance learning. I have received some of the most positive feedback from these students. They can discuss, they can participate in learning at a peer level, and no one knows who they are or what they look like. It may take them five hours to type a paper, but they can do it. They have a feeling of accomplishment and elevated self-esteem.

AL: **Can you describe some of the challenges for disabled students?**

AA: My most challenged student was a paraplegic, semi-blind, and had mobility in only one finger!

Some students are using adaptive computer keyboards. We also have readers that can record textbooks in audio format for visually impaired students. The Internet classes have opened up education for home-bound students too. We are working with a ministry that is able to visit the a home-bound student if they have not been participating in class.

AL: How do you meet the unexpected needs that students might have?

AA: This is the instructor's role in distance learning, since the content is already developed, the teacher then becomes a mentor to help individualize the learning. When an instructor does not have that visual contact with a person, the written or verbal feedback is very important.

AL: How might you describe the diversity of your students?

AA: We are challenged right now by some students who are saying, "Give me the syllabus, the assignments, and I will go and do the work. I don't want to be bothered with lectures and things I already know."

We have a lot of other students that need a bit more assistance. There are some classes where an assignment is due every week, so we can track their progress. In some other courses, we provide the beginning date and ending date and then leave the student on their own with the materials. We are always here if they need help.

Many of our students come with previous knowledge and experience for which we try to give them credit. For example, I teach a number of computer classes. Many of these courses have pre-requisites that cover information working professionals know from the job. So, we talk to them and try to see if that experience matches the course requirements.

AL: That might add up to a lot of work for you...

AA: Yes! I am working on something for one of our computer courses that is a pre-requisite for many of our other courses. It is a self-assessment piece that would allow students to develop their individual learning profile. This would provide a tool so that students can take only the portions of classes that are new to them.

AL: Geographically, where are your students located?

AA: Most of our students are local, although students do span the whole globe. I have five students from Japan now taking a programming class. I have students from Mexico and Antarctica...

AL: Where there challenges in helping these truly distant students?

AA: Not really. Our students are responsible for providing their own "connections," so we can tell them to type in a certain URL and go. We have, however, had a few technical challenges with downloading large media or installing certain plug-ins.

Also, we have a 24-hour help desk. The web site has "frequently asked questions" as well as a series of seven steps, an on-line orientation for new students.

AL: So, if I'm having trouble at 3:00 a.m. wherever I am, I can reach someone by phone...

AA: Yes, you can leave a message on our 24-hour, 1-800 number, and we will return a call as soon as possible. The help desk is open from 7:00 a.m. to 9:00 p.m. (local time) daily and 9 a.m. to 5 p.m. on the weekends.

AL: How many classes have activities that require synchronous communication?

AA: We have a few. From my experience, it is not something that students want. They want asynchronous so they can respond in their own time. We look carefully at the time zone issues. However, any synchronous event can be recorded and accessed via an 800 number, so we have an option to make that recording available for two weeks or more.

And we also have Beep-A-Tutor. With this feature, students can call a number and page a tutor. They will have a response within 45 minutes. Tutors are also available on-line via Internet chat. The tutoring is used most frequently in the languages and in the math courses, but students can get tutoring assistance in any subject.

AL: What kind of student services do you provide?

AA: The same ones that a traditional college does. We have put the whole college on-line; we have an on-line library that has an electronic database of full-text magazine articles. One can search ERIC and over 6000 other electronic resources based on different topics. We have counseling services, job placement services, student services for completing applications to become a tutor, or to complete applications for scholarships. All of these are on-line.

AL: Do you see more changes with future waves of distance learning students?

AA: I can see more interaction with students. I can see more application of learning styles. In every lesson or module, I try to provide options for using information in written, audio, or kinesthetic form.

We are looking at technology that can translate written content into audio in order to aid the hearing impaired students. Also, we have had our site checked for compliance with accessibility standards.

AL: Are you seeing reliable advances in speech recognition software?

AA: Yes, I do see such advances. I am looking at some systems that would allow students to send a message, via the Internet, that would go directly into the faculty's email as a sound file. They would not have to use a phone. The software is getting so much better in making this a reality. We see it in industry, where physicians are doing their dictation via voice-recognition software. Instructors still have to "train" the software to his/her voice, but it is getting more reliable.

continued...

AL: **Are there courses that require collaboration or group work?**

AA: They are very important in our Interpersonal Communication classes which are facilitated with our FirstClass conferencing software. In English classes we have peer reviews on writing assignments which are done via technology. Instructors are seeing superior writing on the drafts they are receiving.

AL: **How many students are taking classes for interest only?**

AA: Quite a few. Many of them are taking computer and health care classes. Our classes are really growing, especially with the enrollment occurring every two weeks. It's not easy for the faculty to stay ahead!

AL: **I can see this. Since we have been talking, your Palm Pilot has been beeping, the phone has rung, and your computer has received an instant message.**

AA: It is busy! As an instructor, if people think teaching on the Internet is easy, they are mistaken! If you are a student thinking taking an on-line class is easier, you are also mistaken.

We have a lot of systems in place to help students. One is a call-in program. In this program, one week after a student signs up for an Internet class, every student is called by a staff member to check their progress. If an instructor is not hearing from a student, he/she can send a request to our course support staff who will keep trying to reach the student. We even have a courier who can pick up materials from students.

We are expanding... We now have some faculty members that teach for us but live out of state. They get all of their orientation on-line or from our faculty handbook. We are creating a course developers handbook on the web so that people elsewhere can develop Rio courses.

AL: **Is there anything you would like to add about our theme of "the changing faces of students?"**

AA: Our society is becoming a placeless one, and we need to look for opportunities to educate our students anytime or anywhere. We need to address this!

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LEE: A Valuable Addition to Language Learning (continued from page 10)

adults. The computer lab was available; consequently, the extra class was set up in the computer lab, and LEE was used as the text.

The students in the new class had attended ESL classes at least one or two semesters but were still at a beginning level. They had had basic computer instruction and used LEE as a supplement to instruction previously. Because the LEE program has student and instructor guides with additional practice available through its web site (http://www.mcli.dist.maricopa.edu/proj/lee/), copies of a student workbook could be printed.

Another feature of the web site is the access to the texts for each lesson of the unit. These were also printed and used to introduce each lesson. Class time was usually spent with an introductory period reviewing the grammar rules and text followed by further practice on the computers. Each student was able to keep track of his progress on the tracking sheet, also a part of the instructional package, which could be downloaded on the web.

Since January 1994, an average of seventy students has attended classes each semester even through the hot summer sessions. These students would not have been found in ESL classes on any college campus. Many of the students did not have transportation or childcare. Some had only progressed through the sixth grade in Mexico, and the familiar environment of El Mirage Elementary school was a more comfortable entry point for their return to a formal classroom. The English as a Second Language classes have enabled these parents to integrate more quickly into the United States and also allowed them to help their children academically. Moreover, the computer instruction has hastened their progress in English language acquisition as well as providing them with computer skills, valuable in an increasingly technological environment. One student confided, "Thanks to English classes and computer instruction, I have much more confidence at my job." Many students are signing up for Spanish GED classes now that they are more comfortable in their new student roles.

Technology, such as LEE, has been a valuable support in their educational journey.

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