

Enlace Quiché

Using ICT Tools to Support Intercultural Bilingual Education

Dot-EDU / Guatemala

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## I. Executive summary

This report describes the context, actions, and impact of Phase II of the Enlace Quiché project. This cooperative agreement was carried out from June 2002 through February 2003 under the dot-EDU leader award as a follow-on to the original Enlace activity begun in 2000 under LearnLink. The report shows how the lessons learned under LearnLink were applied to the new phase to create more impact in less time and with much better cost-benefit. It also describes the transition being made from a project wholly supported by USAID to an independent NGO that will continue to build on the work begun in this activity.

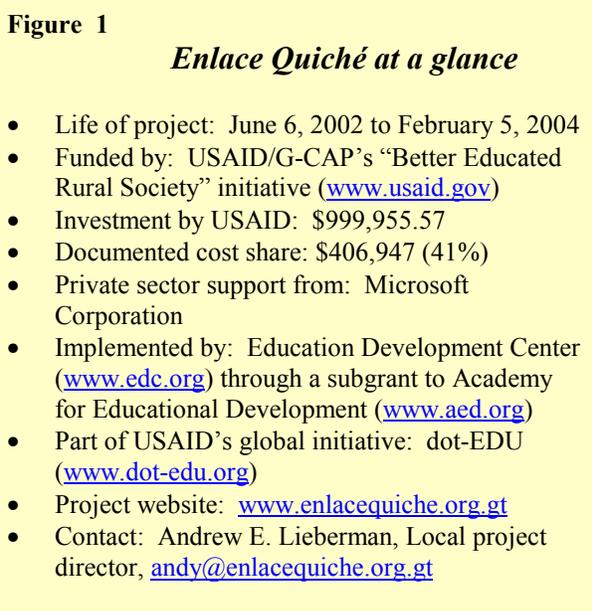
Enlace Quiché has established a total of 20 CETEBIs (Bilingual Intercultural Educational Technology Centers) in and around the Quiché region of Guatemala. 12 are installed in or targeted to bilingual teacher-training schools. 8 are in rural Mayan primary schools. The centers are being used by Mayan students and teachers to create and share didactic resources in Spanish and Mayan languages. 45 school projects were carried out in 2003 and published in a 2-CD set and on the [www.ebiguatemala.org](http://www.ebiguatemala.org) web portal. Children as young as kindergarten are having their first experiences with computers using software in their native Mayan language.

Complementing its work with schools, Enlace has worked with government and non-government organizations. Enlace built capacity in three partner organizations to create interactive digital multimedia CDs. These institutions, with support from Enlace, developed six CDs for children and adults to learn more about Mayan languages. Enlace also led the development of the ebiguatemala virtual community and web portal, forming an inter-institutional council to sustain it.

By the end of the project, Enlace had trained 1,954 students, teachers, parents, and partners in complementary aspects of its vision of information and communications technologies being used as an integral part of the culturally and linguistically relevant education that is mandated in Guatemala's peace agreements.

## II. Introduction

Enlace Quiché is a project that has sought to show the potential that information and communication technologies (ICTs) hold as a tool for improving the quality of education in



rural Guatemalan schools while revitalizing Mayan culture and language. Over the past twenty months, Enlace<sup>1</sup> has opened fifteen new technology centers, created nine CDs, initiated a virtual community, and turned itself into a local NGO. In doing so, those of us involved in Enlace have learned valuable lessons about ICTs and indigenous populations, technology and rural schools, local content production, private sector alliances, and sustainability. This report shares what we did, what we learned, and what we plan to do.

The report is written to a broad audience. It summarizes the actions and impact, while reflecting on what could have been done differently and what needs to be done next. Hopefully, it will spark new ideas and fresh dialog around Guatemala and around the globe for innovation in development through the use of ICTs. The findings we present and the models we offer apply to many sectors and any country. Our hope is to share as much of our internal knowledge as possible in a compact document. We hope that this report will help donors, government officials, and development organizations design and implement new activities that continue to tap the potential of ICTs as a means of building the equitable, healthy, happy world we all seek.

### III. Background

Enlace Quiché is based in the Quiché region of Guatemala. Quiché is a mountainous area populated predominantly by Mayans of several different linguistic groups. It was also the most affected region during Guatemala's civil war from 1960 to 1996 and is still recovering from the psychological and socioeconomic scars left by scorched earth campaigns and other forms of repression against the Mayan majority.

**Figure 2: Location of technology centers**



After leftist guerillas and the government agreed to peace, the country began a long process that seeks to foster reconciliation while building a democratic nation that values its multiculturalism and multilingualism. An important element of the peace agreements is the “Treaty on Indigenous Nations’ Identity and Rights.” This treaty mandates the right of all Guatemalans to receive an education in their native language and appropriate to their culture. This is a stark contrast to the Spanish-only assimilistic education that had been traditionally offered to indigenous populations, both rural and urban.

With help from international agencies, a national education reform initiative was begun in 1997. The reform process is designed as a gradual, permanent movement that will completely transform Guatemala's educational system. It seeks a decentralized, constructivist, practical education that uses active methodologies and community

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<sup>1</sup> Throughout this report, the term “Enlace” is used to represent the collective Enlace team: local staff, AED & EDC home office staff, USAID, NetAssessment, Inc, consultants, and the local stakeholders.

involvement to prepare children for the world in which they live. The dominant theme throughout the reform efforts is that education should be bilingual and intercultural, so that children learn Spanish and their native indigenous language, while developing a knowledge and appreciation of both cultures.

The succeeding governments have been slow to put resources into these efforts, but international cooperation has continued to pressure the government and has been a catalyst for many pilot activities that are showing the possibilities of a true bilingual, intercultural education. USAID's "Better Educated Rural Society" initiative is a prime example begun in 1998, focusing on the Quiché region. A set of complementary projects have been carried out to work on different aspects of the issue. These projects include initiatives to train teachers, increase girls' enrollment, measure impact, and create new materials. Within this package, Enlace Quiché was designed to demonstrate the possibilities that ICTs hold as a catalyst and support for putting the educational reform into practice.

**Figure 3**

***Guatemala at a glance***

Population: 11,678,411  
GDP per capita: \$4,400  
Ethnic groups: Ladino, Mayan, Xinca, and Garifuna  
Languages: Spanish and 21 indigenous languages  
UNDP HDI rank: 119 (one of the lowest in the region)  
% of GDP spent on education: 2.7%  
Combined gross enrollment rate: 57%  
Education index: 0.65

In this context, Enlace Quiché was launched in January 2000. This initial activity, now known as Phase I, was carried out over two years and opened the first five bilingual educational technology centers (CETEBIs) and created five CDs and four storybooks in the centers. It was well-received by stakeholders, including the Ministry of Education, earning itself an extension through the present project, referred to as Phase II. As USAID's current strategy winds down, Enlace's role in the 2004-2008 strategy remains uncertain. However, Enlace staff and local stakeholders, with USAID's support, have transformed the "Enlace Quiché project" into "Asociación Ajb'atz' Enlace Quiché," a Guatemalan NGO that expects to build on the work described here.

## IV. Objectives and expected results

As in any development project, as Enlace Quiché has unfolded over the past four years, it has evolved in response to the local context and outside influences. This section describes the guiding objectives that led Enlace's staff and stakeholders through Phase II.

### A. Expected results

Phase II of Enlace was designed to build on the work begun during Phase I. Since Enlace was already a substantive project, all involved had ideas about what could and should be done in Phase II. The project was designed over several months with input from Phase I staff, USAID, AED, and EDC. The expected results directly reflect the conclusions and lessons learned from Phase I of Enlace.

This broad input into the project design led to a challenge for the project: how to satisfy the expectations of all on a relatively small budget and short timeframe. In the discussions, USAID clearly stated that they were committed to opening more centers and creating more materials in order to build a critical mass of centers and materials in the region. They also looked to develop a network of practitioners who could support each other, not just regarding the technology centers, but in other aspects of bilingual education methodologies. EDC championed the need to center all interventions in the schools on classroom impact. They focused on the didactic quality of the materials, wanting to ensure that any new materials would have specific learning objectives and be integrated into classroom processes. The local staff centered on improving implementation strategies to increase impact and cost-benefit.

**Figure 4**

### *Expected results as established by the cooperative agreement*

Result 1: Improved access to bilingual education technology centers for bilingual educators, students, parents and community members in Quiché and neighboring areas.

- At least seven (7) new "Enlace Quiché" Bilingual Education Technology Centers of Excellence are established in El Quiché or neighboring areas.
- Ongoing technical support is provided for 12 or more centers (the 5 current centers plus at least seven (7) additional).

Result 2: ICT materials created to support teacher professional development and improved educational quality

- To improve their quality and utility, materials created under LearnLink are revised, finalized, distributed and applied and new materials are produced.
- Partners have increased capacity to create instructional materials through the application of ICT.

Result 3: Increased impact of ICT on Guatemalan educational systems

- A network of bilingual teacher-training centers is established to allow teachers to learn from each other, as well as from experts.
- Human capacity development improved throughout El Quiché and neighboring regions, through building a cadre of education technology specialists and technically knowledgeable professionals.
- Dialogue undertaken with the Ministry of Education to extend ICT services and applications within national education policies and strategies and include Information Communication Technology (ICT) in the curriculum of local teacher-training schools.

All agreed that Phase II had to bring in more stakeholder participation. For example, instead of creating interactive digital CDs “in-house” as was done in Phase I, the idea under Phase II was to build capacity in partner institutions to create these CDs. The network of bilingual education practitioners also had to be designed such that it leveraged resources of stakeholder institutions.

All of this and more can be seen in the expected results. In the subsequent implementation, the project worked simultaneously in all areas. Considering the short time frame, about 16 months of technical activities, the project showed a major impact in each result.

## ***B. Work plan***

After agreeing to the expected results, the local staff was faced with the task of developing a work plan and detailed budget that would achieve the desired outcomes on the limited resources and time that they had. The local project director used a logical framework planning process and opened the process to field staff, home staff, USAID, and NetAssessment, Inc.<sup>2</sup> This helped build common goals and a strong commitment to the planned activities. It also raised awareness of the limitations that the project would affront.

By the date that the agreement between USAID and EDC was signed, most of the staff had already been selected. Some had worked with the project directly under Phase I, others had been stakeholders, and others were completely new. During the early weeks, all staff participated in a variety of orientation activities, including talks on themes relating to bilingual education, Mayan language and culture, and ICTs for development. This helped to build and orient the team, before writing the plan.

Following the logical framework process, the staff began by developing vision and mission statements. Once consensus was reached, these statements became sacred. Staff were committed to them and were reticent to support any activity that could not be linked directly to the mission.

From the mission and expected results, the staff followed a fluid process of creating indicators, actions, means of verification, and risks. Near the end of the process, local staff

**Figure 5**

### ***Project vision and mission statements***

*Vision: That the Mayan community may receive a quality education with linguistic and cultural pertinence, facilitated by an educational community that has at its disposal technology centers and abundant bilingual educational resources.*

*Mission: Lead the integration of technology and bilingual intercultural education by promoting:*

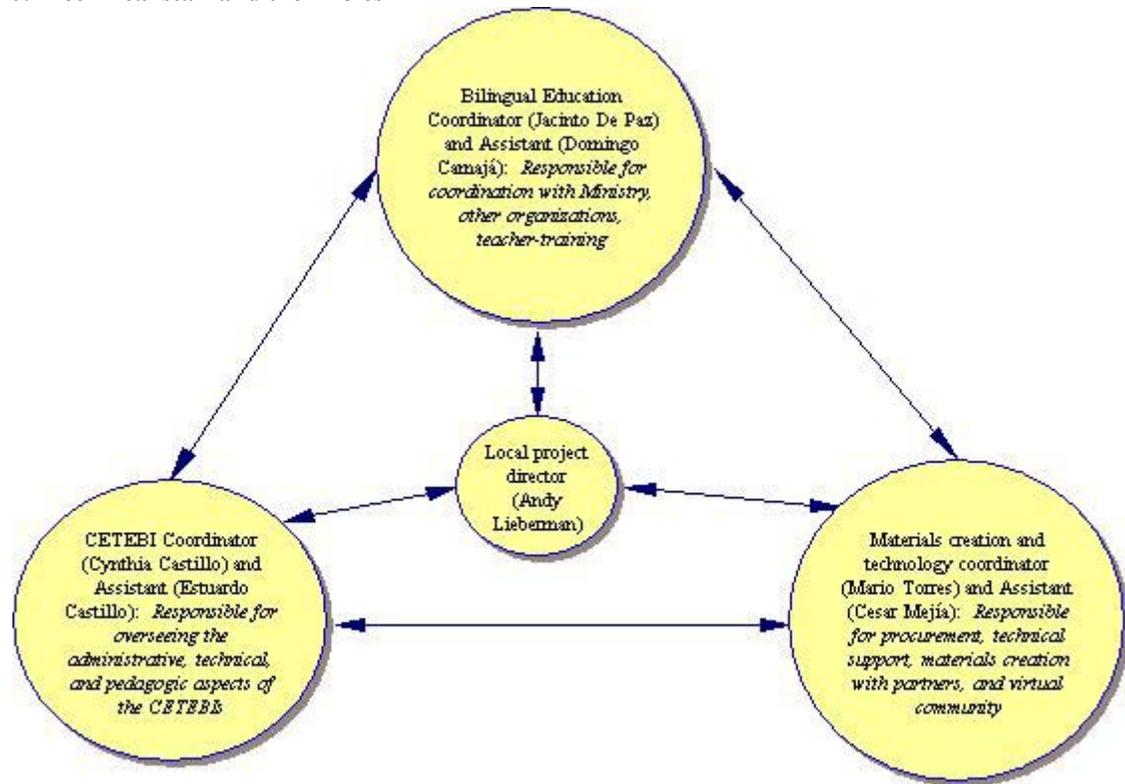
- *The creation and improvement of bilingual educational materials,*
- *The sustainable access to ICTs,*
- *Training for the educational community, and*
- *Exchange of resources and ideas.*

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<sup>2</sup> NetAssessment, Inc. was the firm responsible for monitoring and evaluation of the project

were joined by USAID, AED home office staff, and the monitoring and evaluation consultant. This larger Enlace team worked to sharpen ideas, build a team, and make a group commitment to the project in general, and specifically the plan.

**Figure 6: Technical staff and their roles**



One of the complicated issues was how to divide the multi-disciplinary tasks among the multi-disciplinary staff. The ideal profile of the technical staff for most activities was a person who had strong experience in teacher training, student-centered, bilingual methodologies, and had strong skills in the use of computers and Internet. Such human resource is not available in Quiché, if at all in Guatemala. The staff was divided between those who had strong backgrounds in bilingual education and some technology skills versus those who had strong backgrounds in ICTs and the will to share their skills with the bilingual education community. Over the life of the project, this mix sometimes created synergy and sometimes caused tension. However, the unity of purpose and personal dedication kept the staff focused on the project and let the team meet its goals.

Another confusing issue for the project has to do with the discrepancy between what bilingual teacher training should look like and what it really looks like. The work plan assumes that all stakeholders will be Mayan people or organizations who speak their native language and support bilingual education. Despite a careful selection process, this was only true to varying degrees. In many schools, the majority of the teachers and a significant percentage of the students are not Mayan and/or do not speak the local language. This compelled the staff, especially the bilingual education specialists, to devote extra time to promoting bilingual education, which took resources away from activities such as training in project-based learning.

## **C. Trends**

As the project was implemented, the guiding principles, plans, and staff remained constant. However, the project was also influenced by outside events and stakeholder needs. Several trends that affected the project are worth mentioning.

### **1. Training and capacity building**

In Phase II, Enlace placed a major emphasis in building capacity in the partner schools and other stakeholders. As computers and Internet were quickly becoming more and more commonplace in the region, there was an ever-growing interest in learning to use them. In contrast to Phase I, during which the stakeholders constantly asked for equipment, under Phase II, the stakeholders placed more value on the training they received. Participants expressed sincere thanks for the training and showed commitment to apply their new skills in their schools and organizations.

One of the greatest strengths of the project became its technical staff who had computer skills far above any other development project in the region. By working directly with partner institutions and with CETEBI administrators, the Enlace staff transferred the ICT skills immersed in the project vision. Despite the short life of the project, it was able to build a critical mass of proponents in partner organizations who will continue forward without the direct support of Enlace. Beyond purely technical skills, Enlace was also able to reach students, teachers, and parents directly and present a vision of bilingual intercultural education supported by technology.

### **2. Connectivity**

Internet connectivity was not originally an integral element of the CETEBI model. It was seen more as an extra, since the focus of Enlace has been on local production of digital materials for local use. At the time the first CETEBIs were opened in late 2000, connectivity costs in rural Guatemala were still prohibitively high, \$2200 for installation and \$840 per month. Further, few educators or education organizations used Internet or e-mail, so Enlace would have had to promote Internet not only with its direct stakeholders, but nationally as well. Enlace was also cautioned that Internet access early on could distract the students and teachers from the project objectives.

Even in mid-2002 as Phase II was being designed, connectivity costs were still high enough that sustainability and cost-benefit were questionable. The lowest prices were \$1500 for installation and \$375 per month. In the work plan, the team expected that some centers would have Internet and others would not. At this juncture, with Internet becoming more popular in the region and with the planned ebiguatemala virtual web portal, lack of connectivity began to be seen as a limitation. However, the project felt that it would be unwise to subsidize recurrent costs such as monthly connection fees. The staff proposed creating local Intranets in each school without Internet, in which information could be shared easily in the school and fed with CD-ROMs and other content downloaded from Internet.

However, in late 2002, the Hughes DirecWay satellite Internet systems entered the Guatemalan market. The cost was \$1800 for installation and monthly costs as low as \$150. This monthly cost could easily be covered by the existing and new CETEBIs with student fees or by selling a few hours of time to the community per day. The project decided to push, but not force, the centers to get online. Enlace offered to train the center administrators and pay for the installation and first two months. In the end, though, all of the centers chose to install Internet.

The project hoped that the schools would become active members of the ebiguatemala virtual community, contributing materials, downloading resources, and communicating amongst themselves and with Enlace staff through discussion boards, e-mail, and chat. This did happen to a certain extent, but has yet to reach its full potential. A major limitation was that the Internet connections were installed mid-way through the 2003 school year, meaning that the teachers and students only had a few months to learn to use Internet and make good use of it. Technical difficulties in keeping the satellite signals working caused frustration and limited the access. However, all centers consider Internet invaluable for research, expressing interest in learning more about Internet and sensing the potential it holds for them. In the upcoming months and years, they will make better use of their connectivity.

### **3. Technical support**

Enlace Quiché's motto has always been, "Teaching with computers, not about computers." However, with so much equipment, software, and connectivity, and a lack of local capacity in using it, Enlace had to allocate much of its resources to resolving problems in the centers. After all, if the centers were not fully functioning, they could not be used to create Mayan language materials or anything else.

The recurring problems included maintaining the Internet connections, keeping the local area networks functioning, and repairing the older, used computers that Enlace gave the schools. Enlace staff worked to resolve the problems while building capacity in the center administrators to resolve problems on their own. To the extent possible, the problems were resolved remotely, although visits were inevitable, especially to those centers whose administrators had weaker initial technical skills.

To this end, Enlace made good use of technology to provide assistance. Enlace staff and administrators communicated via telephone, e-mail, instant messages, and a discussion board in the ebiguatemala web portal. Further, a free software (VNC viewer) let Enlace staff take control of a center's server from the project office and identify problems.

Another important strategy that Enlace implemented was to encourage direct communication between the CETEBIs and the vendors or service providers, rather than Enlace being responsible for solving all problems. This served both to lower Enlace's workload and to make the centers more sustainable. Since this was project policy, the centers quickly learned that they could always count on Enlace for advice and support, but that the CETEBI was ultimately responsible for solving their problems.

#### **4. Impact beyond Quiché**

Even in Phase II, Enlace was still structured as a pilot project designed to show the potential of ICTs in the educational reform process. While parts of result 3 look to building a network of practitioners and dialog with the Ministry of Education, the project was not designed to have a specific national impact, much less an impact outside of Guatemala. However, Enlace has sparked tremendous interest around the country and around the world.

USAID, dot-EDU, AED, and EDC have all supported Enlace's projection. Enlace staff and stakeholders have presented at conferences around the country and around the world, even winning a prize for the Jun E (A destiny) CD-ROM at the World Summit on the Information Society. This projection is discussed in the section on "Impact beyond Guatemala" on page 31. Much of the interest has stemmed from Enlace's relative success in empowering local indigenous to create authentic, innovative, meaningful content. The Enlace staff and USAID have helped local stakeholders to be aware of Enlace's projection and to use it to motivate them to continue to build on what Enlace has begun.

#### **5. Metamorphosis from project to NGO**

Enlace staff had hoped that as long as they showed results in their activities that USAID would continue to fund new activities. Due to changing USAID priorities, however, it became clear that USAID was unlikely to be able to invest more money in Enlace. Meanwhile, Enlace was in contact with other potential donors and other agencies that were beginning to look at Enlace Quiché more as a NGO than an international development project.

Staff and stakeholders shared two ideas. First, the CETEBIs were sustainable to a certain degree, but still needed much more technical assistance to fully reach their potential. Second, there was a conviction that what Enlace was doing was just skimming the surface of what can be done to find synergy between ICTs and indigenous communities. For each material created, there were numerous ideas for future projects.

About six months before the project's close, the local project director proposed converting Enlace into a NGO as an exit strategy to both AED and USAID. Both organizations pledged their support. Once this became the official next step for Enlace Quiché, a parallel process of starting the NGO while finishing the Phase II deliverables was put in place. Unfortunately, this was an insufficient amount of time to make a smooth transition. However, thanks to strong, local commitment to the NGO and support from AED, USAID, and Microsoft Corporation, the transition has been made as of the close of the cooperative agreement with USAID. This transition is described more in depth on page 32 under actions and impacts.

## V. Actions and impacts

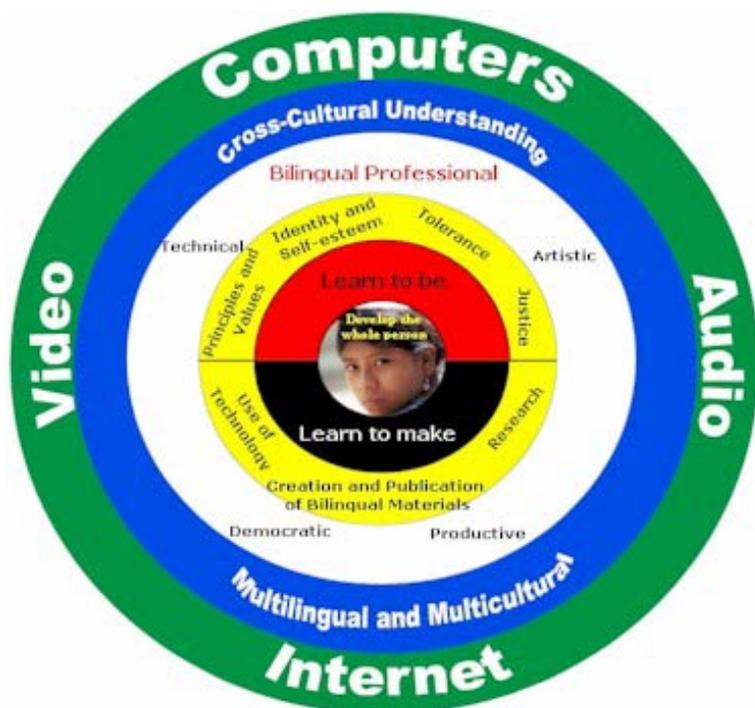
From September 2002 through November 2003, Enlace Quiché was focused upon implementation of its work plan, striving to meet its indicators and the expected results. This section presents the actions and impacts by thematic areas, giving the reader a glimpse into each area.

### **A. CETEBIs: Bilingual intercultural educational technology centers**

The most visible and most resource-intensive activity in the project was opening and supporting CETEBIs. USAID sought to build a critical mass of technology centers and people who were actively using them to support bilingual education. Now created, this critical mass should be more sustainable since the teachers and center administrators can support each other directly. Also the higher visibility of a larger number of centers should help to generate more interest from the Ministry of Education and other cooperating organizations.

#### **1. Seven new CETEBIs and renewed commitment from five existing CETEBIs**

Figure 7: Vision of the CETEBI model



To build this critical mass and gain high visibility, the five existing centers were insufficient. While, private computer academies and Internet cafes were appearing in many towns in the region, Enlace did not see them as good candidates for being converted into CETEBIs. One limiting factor was the physical location of the centers off school premises, making it unlikely that there could be a tight integration between the center and the curriculum. Further, private centers, with rare exceptions, do not have either the social service mission nor the bilingual intercultural aspects that are integral elements of the CETEBI model.

Consequently, Enlace began a selection process, focused upon, but not limited to, bilingual teacher-training high schools in and around Quiché. Many of the groups visited

had expressed interest in working with Enlace on previous occasions. Others were recommended by project staff and stakeholders as good candidates.

Staff visited each potential center and rated its capacity and interest to fulfill the project's requirements. This included a commitment to bilingual intercultural education and interest in creating didactic resources in Mayan language. Further, each candidate had to show capacity to provide adequate facilities for the center and cover all recurrent costs, such as the center administrator's salary, electricity, Internet fees, etc. The candidates were rated using a rubric that contemplated the candidate's commitment to bilingual education, ability to sustain the center, and commitment to working with Enlace.

The five existing CETEBIs were also visited and rated. Three were going strong. Two were weak, being used as mere computer laboratories. However, Enlace included them in Phase II, hoping to rekindle the interest they had shown in Phase I. These five centers were also offered some additional equipment that was provided in Phase II, most notably Internet connections and multimedia projectors.

All twelve CETEBIs signed memorandum of understanding with Enlace that delimited the responsibilities of each party. These documents were signed in a formal meeting with the presence of USAID and Ministry of Education officials. The centers had the reassurance that Enlace would provide hardware, software, training, and technical assistance. Enlace had commitment from the centers that they would cover all recurrent costs and implement sustainability strategies.

## **2. Hardware and software**

In Phase II, Enlace had approximately \$100,000 to equip the seven new CETEBIs. Project staff had to carefully weigh the costs and benefits associated with each item and find ways to minimize costs. With class sizes of forty to fifty students, the centers should ideally have twenty to twenty-five computers as a minimum. Each computer needed software as well. Further, the centers had to have Internet connections and multimedia equipment.

To get the most computers for the available funds, Enlace worked with World Computer Exchange,<sup>3</sup> which provided over 200 used computers. In retrospect, the benefit of this strategy is questionable. There was a six-month process of waiting for and renovating the computers, most of which were five or more years old. The end result was an investment of \$150 per computer (counting direct costs and staff time) for systems too outdated to run current software and with short expected lives due to unavailability of parts such as hard disks. For future activities, Enlace plans to purchase new, low-price clones, which are readily available for under \$400.

Another important issue concerned what accessories to purchase and in what quantity. To lower costs and reduce complexity, Enlace used entry-level equipment. For

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<sup>3</sup> [www.worldcomputerexchange.org](http://www.worldcomputerexchange.org)

example, personal laser printers, color printers and photocopiers were purchased. Advantages included low initial cost, ease of finding supplies and service, and more potential for being replaced by the CETEBI as needed.

CETEBIs also need a variety of multimedia equipment. Digital cameras were used heavily for photographing events as well as for including photos in student projects. Enlace provided a simple scanner, which was used for scanning student-drawn artwork. Originally, Enlace purchased only a few multimedia projectors and digital video cameras, loaning them to the centers on request. Enlace quickly saw that the schools were making good use of the multimedia projectors, both in the CETEBIs and by taking them to the classroom for presentations. Enlace ended up purchasing one for nearly every CETEBI. The digital video cameras, despite expressed interest and training, have only been used minimally.

Regarding software, at the beginning of Phase II, Enlace had to choose whether to adopt Linux or stay with Microsoft. In Guatemala, Linux is used by only a few pioneers and little support is available. However, considering the high level of technical savvy that Enlace had, the staff was motivated to commit to this alternative, especially considering that it would help make the CETEBI model less expensive.

Meanwhile, Enlace was also negotiating with Microsoft Corporation, thanks to a connection from USAID Washington's private sector liaison. Microsoft offered free licenses for Windows and Office for all the computers Enlace needed, as well as the possibility of cash for training. Enlace could not resist this offer, since it resolved many needs. Aside from not having to pay for licenses, Enlace would be receiving large, easy-to-document cost share, which would help it meet contractual requirements. Further, the staff and local partners were already familiar with Microsoft products and had training materials at hand. This meant that there would be fewer delays in getting the centers up and running. This decision has been positive in the short term, although in the medium term Enlace may have lost an opportunity to help Linux build a user base in Guatemala.

### **3. The teacher and the CETEBI**

Ideally, teachers in a CETEBI-equipped school should exemplify all that Guatemala's educational reform movement expects of its teachers and then some. They should be from the community, speak the local language, and be trained in active learning and student-centered methodologies. They should also have the skills to undertake student projects that make use of the CETEBIs.

In practice, this is still only partially true. Most teachers are from the community, but many are *ladino* and do not speak the local language, nor have much knowledge of bilingual education. Most of the teachers also work long mornings as elementary school teachers in villages outside of town. Their work at the teacher-training high schools with CETEBIs is a side job, where they arrive to teach their courses at specified times. This leaves them with little time to work in the center or coordinate student projects outside of class hours. Other limitations include large class sizes (40-50 students), short periods (30-40 minutes), lack of training in new methodologies, and the lack of resources.

Despite these limitations, Enlace and many of the CETEBI teachers did begin to demonstrate the potential of project-based learning using the CETEBIs. The projects, as described more on page 23 generally consisted of group student investigations (for example, about local medicinal plants.) In class, teachers formed the groups, assigned topics, and detailed expectations. Outside of class, students were responsible for doing community investigations and processing the information during their assigned time in the CETEBI or during other free moments. Up to this point, the project generally fit in well with course objectives and had an orderly participation. A problem arose in that students, teachers, and Enlace all expected these investigations to be turned into productions of high enough quality to distribute in print form and publish in Internet. This requires a large effort on the part of the teacher to unite each group's work and to edit all of the project materials. In the materials published by Enlace in late 2003, much of this final production was coordinated and carried out with the direct support of Enlace.

Despite the challenges, participating teachers and students intend to carry out similar projects in 2004. They expect to be able to make better materials and integrate the projects into their curriculum. A final Enlace workshop at the start of 2004 helped the teachers learn principles for designing student projects. It also reinforced the idea that the process of the project is more important than the product.

#### **4. The student and the CETEBI**

Students use the CETEBIs several hours per week in differing ways. All receive a computer course for an average of three hours per week. During this time, students learn computer skills and also use the time to work on course projects. For this course, the students pay around \$4 per month. If students wish to use the center at other times, they can do so, but generally have to pay \$0.30 to \$1.00 per hour. Students also must pay for printing. This income makes the center sustainable, but also limits the amount of time when it can be used.

#### **5. The parent and the CETEBI**

Parents have been supportive of the CETEBIs and have demonstrated their willingness to support them economically through user fees. They believe that it is worth the extra investment because they believe that it is important for their children to have technology skills to get ahead.

Enlace held a series of workshops with parents groups in each CETEBI to share the CETEBI model of synergy between bilingual education and ICTs. After each workshop, parents were offered an introductory course in computer use (financed by Enlace.) These proved very successful in helping parents understand what the CETEBI is about and in creating a larger user base.

#### **6. The community and the CETEBI**

Enlace has always encouraged partners to open CETEBIs to the community on a fee-for-service basis. Some schools, such as the Nebaj, have fully embraced this idea,

offering a wide range of courses and drop-in services to other schools, community groups, and individuals. Others have shied away from this service, feeling that the risk of opening the center to “people off the street” outweighs the potential benefits. Schools are able to cover their recurrent costs just with student fees and the students keep the center generally full. Enlace has accepted this posture as valid, expecting that community needs will be met by entreprenuring community members. It will be satisfying to see future graduates from CETEBI-equipped schools open Internet cafes and computer academies to meet these needs.

## **7. Sustainability**

In less than a year, Enlace opened the new CETEBIs and helped them reach a reasonable level of financial, technical, and pedagogical sustainability.

The selection process and initial agreements made financial and administrative sustainability almost a given for each center. Enlace chose only established partner institutions that showed a clear capacity to manage their institutions. By selecting schools or other groups with fixed user bases, the CETEBI guaranteed a monthly income that could cover its costs. Further, by requiring that each center cover its recurrent costs from the outset, the centers never expected subsidies.

Technical sustainability continues to be a concern for the CETEBIs. Enlace worked to train center administrators in how to keep all the equipment functioning. However, the project knew that relying on the administrator alone was risky, since she or he could leave the center at any moment. Further, the centers should be open much more than forty hours per week, meaning that other people need to be able to attend the center. Enlace formed a “technical team,” nominally made up of the center administrator, two teachers, and three junior-year students. Seeking gender balance, Enlace required at least two female members. This team received extra training and Enlace tried to channel all technical assistance to the centers through the team. This strategy proved very effective because the teachers tended to be those who took on materials creation projects and the students were those who became the leaders in the final production of the materials. In this way, the administrator had an internal support network, and each school began to build its own capacity.

The CETEBI model implies a tight link between the classroom and the technology center. Enlace tried to build that during the 2003 school year by organizing materials creation projects as class projects. At this juncture it is unclear how much sustainability was achieved in this area. However, at the beginning of the 2004 school year, all of the schools mentioned their intention to continue student projects using the technology center.

### ***B. Mini-CETEBIs in rural bilingual elementary schools***

Although not originally included in its work plan, Enlace also opened eight mini-CETEBIs in rural elementary schools in villages outside of towns with CETEBIs. This arose as a joint project between Enlace and PAEBI, another project funded by USAID also working to strengthen bilingual education in Quiché. USAID and the Ministry of

Education were interested in seeing technology reach rural areas. Further, many people were asking how the graduates of CETEBI-equipped teacher-training schools would be able to apply their skills when teaching in rural elementary schools when these schools have no computers. This activity was added to both projects' work plans to begin to build a simple CETEBI model that can be used for children from grades K-6 in rural schools.

## **1. Creation of eight mini-CETEBIs**

Enlace worked with PAEBI to select eight schools. The schools had to be physically close to a town with a CETEBI and had to be schools that PAEBI was actively supporting. In addition, they had to be able to provide adequate facilities, installations, furniture, electricity, and security. As a last requirement, the school had to identify a teacher who had some basic computer skills and was willing to take responsibility for the center.

The centers were equipped very simply with 10 donated computers from World Computer Exchange and a new black and white laser printed purchased by PAEBI. No other accessories were provided.

## **2. The community and the mini-CETEBI**

The mini-CETEBIs were granted to the parent groups who oversee the functioning of the school. This was in contrast to the CETEBIs that were granted directly to the school principal. From the outset, the parents were heavily involved. The communities realized that this was a special opportunity and rallied together to quickly provide the necessary conditions to receive and protect the computers. Enlace and PAEBI used the Mayan concept of “yekb’äl” (seed capital) to explain the computer donation. Just as parents give children part of an existing land or family business to work on their own, USAID was giving them some computers and initial training. It is each community’s responsibility to dedicate the required effort to make the center prosper. It has been satisfying to see the gratitude and dedication of the communities for having the mini-CETEBIs in their schools.

## **3. The teacher and the mini-CETEBI**

The mini-CETEBIs were installed with only a few months remaining in the 2003 school year. So, it is still much too early to document how these centers will be used in the process. However, the centers hold great promise. Teachers are still learning the basics of using the computers and have yet to receive training in integration of classroom processes and computer-based activities.

Nonetheless, teachers were creatively finding ways to use the computers with their students. The most frequent use of the centers was to use the Jun E software developed by Enlace and PAEBI (see page 19). This software was linked to classroom methodologies and materials supported by PAEBI. Since it is completely in Mayan language and designed for grades K-3, it was culturally and pedagogically accessible. Teachers also reported success using “Let’s Broaden our Thinking,” created by Enlace under Phase I for Mayan language literacy. Although this software was designed for older students, teachers

reported that students as young as first grade were using it to learn the K'iche' or Ixil alphabet. Other teachers made use of Paint and MS Word to reinforce other competencies that were being taught in the classroom.

Under an agreement between PAEBI and the Enlace Quiché NGO, Enlace will work with these teachers during the 2004 school year to help them make a more pedagogic use of the centers, linking them better to classroom activities. Enlace will select relevant freeware and existing Mayan language materials and develop a series of teaching guides that present activities that use the mini-CETEBIs to develop specific competencies specified in the new bilingual primary school curriculum.

#### **4. The student and the mini-CETEBI**

Children adapt to nearly any learning environment. Naturally, they took to the computers immediately. What is significant about this experience, however, is that their first exposure to computers fit harmoniously into their language and culture. Thanks to the Jun E software, these young students saw familiar-looking scenes on the computer screen, heard the computer speak in their native language, and read text in their language as well. When teachers explained computer use to the students it was done wholly in the Mayan language. This captures the true essence of the CETEBI model and Guatemala's educational reform process.

*We have taken full advantage of the technology in the school. We have seen impact in better attendance, more participation, interest in learning more about their culture, developed oral expression, interest in learning new things. – Griselda Ventura, teacher and mini-CETEBI administrator in the Chirij Tz'aq, Joyabaj school.*

#### **5. The relation between mini-CETEBIs and nearby CETEBIs**

To make the mini-CETEBIs sustainable, Enlace had to find ways to provide local support. This is being done by encouraging the mini-CETEBIs teacher-administrators to seek technical support and other services from the CETEBIs. Most teachers in the schools with mini-CETEBIs reside in the neighboring town, in which there is a CETEBI. Since they travel daily from the town to their school, they can, in theory, go to the CETEBI in the afternoon, evening, or weekend to take courses, borrow multimedia equipment, use the Internet or seek technical assistance from the CETEBI administrator.

In the early months of the mini-CETEBIs, this has occurred to varying degrees. In some cases, the CETEBI administrators are weak and the mini-CETEBIs have found other support services in the community. In Sacapulas, however, the CETEBI administrator has taken great interest in the mini-CETEBIs and has provided training for the teachers and is even designing his university comprehensive project to support the two mini-CETEBIs in villages outside of Sacapulas.

## C. Content production and use

Ever since its conception, Enlace's primary objective has been to find ways to use ICTs to improve the quality, quantity, and distribution of bilingual intercultural teaching resources. Government and non-government organizations have created resources over the years, mostly in print form. However, limited budgets and poor distribution channels have prevented many of these materials from reaching all the schools in need. Further, the educational reform process promotes decentralization, implying that textbooks and other support materials should be created at a local level, so as to best respond to the local language and culture. To this end, the CETEBIs should become important materials creation and distribution centers.

All of the Enlace Quiché materials are available for online use and download at:

[www.enlacequiche.org.gt/areas/areas.htm](http://www.enlacequiche.org.gt/areas/areas.htm)

Enlace has also worked to pioneer the creation of materials to be used in digital format. Digital materials that can be used via Internet or on CD-ROMs are generally nonexistent in Guatemala's bilingual education sector. However, Enlace has strived to show that, as computers and Internet access become continually more common, digital materials will have more and more use. These materials offer the potential of interactivity, which help hold students' interest and improve learning. Another benefit of digital materials is that the reproduction cost is much lower than that of print materials and distribution via the Internet is not only free, but potentially instantaneous.

During Phase II, Enlace worked to spark the creation of materials through a variety of strategies. Enlace built capacity in partner institutions to create their own interactive, digital materials. Enlace also worked with teachers and students to create print and digital materials in the CETEBIs. These early experiences provide useful materials that are already being used. More importantly, they offer models, templates, guidelines, ideas and inspiration for other organizations and schools to follow.

### 1. Creation of materials with partner institutions

Enlace developed three distinct partnerships with institutions that were already producing innovative print materials and had the interest and potential to create digital materials. These three partnerships produced valuable digital resources as well as beneficial tools and lessons learned.

To form these alliances, Enlace sought established organizations and projects that had strong capacity in Mayan language instruction, bilingual methodologies, and teacher-training. These organizations also had to be able to cover a major share of the cost of each project; especially the staff time of those who would receive training and produce the materials. A further criterion was

**Figure 8**

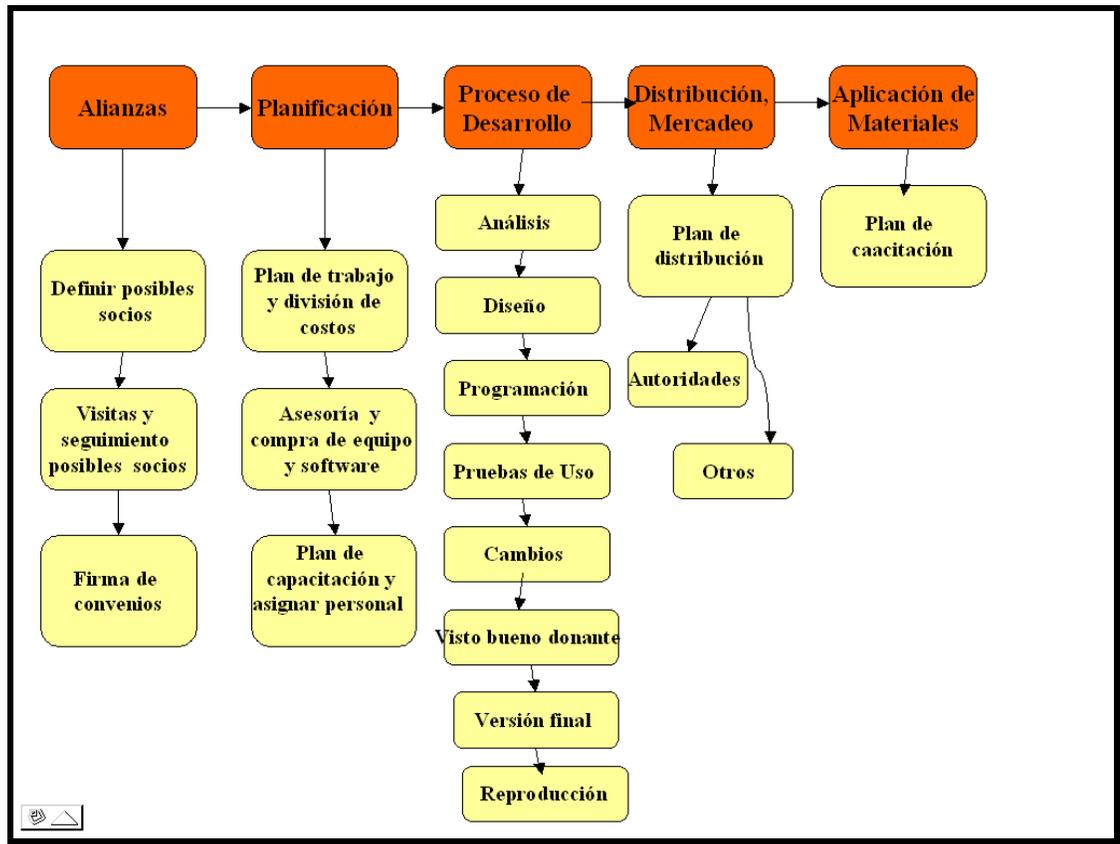
The Jun E (A Destiny) program was recognized by the World Summit on the Information Society as one of the top digital contents in the world, bringing "*a new dimension to bilingual intercultural education.*"



[www.wsis-award.org](http://www.wsis-award.org)

that it should also be likely that the institutions would have the interest, capacity, and resources to continue creating digital materials without Enlace's help.

Figure 9: The materials creation process



During late 2002, Enlace staff approached several institutions and others approached Enlace. Three organizations committed to carrying out the projects described in the following sections. In each case, a formal agreement was signed that divided the costs and responsibilities among Enlace and the partner organization. Further, a timeline was developed that would take each project through the steps shown in the above chart. During 2003, the projects were carried out in their entirety and presented publicly in October.

Each partnership was as different as the resulting materials. The table on the next page summarizes key information about the materials and their creation.

**Figure 10: Summary of the materials created with partners**

<p>Project name:</p>	<p>Weaving the Mayan Language (Tz'utujil, K'iche', Sakapulteko, Uspanteko) – 4 CD set</p> 	<p>Jun E (A destiny)</p> 	<p>The Translation to Mayan Languages: A Self-study Virtual Guide</p> 
<p>Partner:</p>	<p>Mayan Languages Academy of Guatemala (ALMG) <a href="http://www.almg.org">www.almg.org</a></p> 	<p>Access to Intercultural Bilingual Education Project (PAEBI/World Learning/USAID) <a href="http://www.worldlearning.org/wlid/aibe.html">www.worldlearning.org/wlid/aibe.html</a></p> 	<p>Oxlajuj Keej Maya' Ajtz'iib' (OKMA) <a href="http://www.okma.org">www.okma.org</a></p> 
<p>Partner profile:</p>	<p>The Mayan Languages Academy is an autonomous government entity that regulates and promotes the Mayan languages. It has a central office in Guatemala City and a regional office in each of the 21 linguistic communities.</p>	<p>PAEBI is a USAID-funded initiative designed to increase access to bilingual intercultural education in the Quiché region.</p>	<p>OKMA is a Mayan linguistics association dedicated to linguistic research for the revitalization, codification, and standardization of the Mayan languages.</p>
<p>Description:</p>	<p>These CDs help Mayan speakers who are literate in Spanish to learn to read and write in their native Mayan language through interactive, multimedia exercises. It is based on the proven methodology used by the Mayan Languages Academy.</p>	<p>This CD, designed especially for children in grades K-3, presents interactive Mayan cultural scenes that allow students to strengthen the use of their native language. It includes a tool that lets users add new languages, new scenes, and new activities.</p>	<p>This CD is an interactive course developed for people interested in learning about translation using global standards. It focuses on common problems and how Mayan translators have solved them. The course includes interactive comprehension exercises.</p>
<p>Platform:</p>	<p>HTML with QuickTime. Can be used online or from the CD-ROM</p>	<p>Visual Basic. End users can add new content and even new languages.</p>	<p>HTML with QuickTime. Can be used online or from the CD-ROM</p>
<p>Link for more information and download:</p>	<p><a href="http://www.enlacequiche.org.gt/areas/ficha_10.htm">www.enlacequiche.org.gt/areas/ficha_10.htm</a></p>	<p><a href="http://www.enlacequiche.org.gt/areas/ficha_11.htm">www.enlacequiche.org.gt/areas/ficha_11.htm</a></p>	<p><a href="http://www.enlacequiche.org.gt/areas/ficha_12.htm">www.enlacequiche.org.gt/areas/ficha_12.htm</a></p>

Project name:	Weaving the Mayan Language (Tz'utujil, K'iche', Sakapulteko, Uspanteko) – 4 CD set 	Jun E (A destiny) 	The Translation to Mayan Languages: A Self-study Virtual Guide 
Partner's contributions:	<ul style="list-style-type: none"> <li>• An already established methodology for teaching Mayan speakers to read and write in their language</li> <li>• Staff time (approx. 320 hours per CD)</li> <li>• Purchase of digital cameras and microphones</li> </ul>	<ul style="list-style-type: none"> <li>• A set of culturally-based oral expression posters with methodology and teachers trained in their use</li> <li>• Staff time for coordinating the project</li> <li>• Outsourcing of a programmer</li> <li>• Teacher training</li> </ul>	<ul style="list-style-type: none"> <li>• Direct involvement of technical director</li> <li>• Hired a professional translator to create content and coordinate the project</li> <li>• Hired a programmer and two linguists</li> <li>• Already had computers</li> </ul>
Enlace's contributions:	<ul style="list-style-type: none"> <li>• Training in sound recording, photo editing, and interactive course design in FrontPage</li> <li>• Technical assistance</li> <li>• Follow up and coordination</li> <li>• Purchase of computers</li> </ul>	<ul style="list-style-type: none"> <li>• Technical assistance throughout the process</li> <li>• Coordination of usability testing</li> </ul>	<ul style="list-style-type: none"> <li>• Technical assistance throughout the process</li> <li>• Coordination of usability testing</li> <li>• Purchase of software and a digital camera</li> </ul>
Built capacity:	<ul style="list-style-type: none"> <li>• 10 technical staff trained to carry out similar projects with minimal outside help</li> </ul>	<ul style="list-style-type: none"> <li>• PAEBI now has the experience to carry out further digital projects on its own</li> </ul>	<ul style="list-style-type: none"> <li>• Now has the institutional experience to carry out further digital projects on its own</li> <li>• Retained the programmer after this project to work on other projects</li> </ul>
Plans:	<ul style="list-style-type: none"> <li>• Use this CD as a template for creating the same product in other languages</li> <li>• Create a course for non-Mayan language speakers</li> </ul>	<ul style="list-style-type: none"> <li>• Open 10 more mini-CETEBIs in 2004</li> <li>• Develop teaching guides that link the Jun E software to classroom activities</li> </ul>	<ul style="list-style-type: none"> <li>• Create an online database for Mayan translators</li> <li>• Participate fully in the ebiguatemala virtual community</li> <li>• Use this CD as a base for creating virtual grammar guides</li> </ul>



Since this was a new experience for all involved, many lessons were learned throughout. Enlace staff and some teachers had ideas of how to lead project-based learning, but lacked in-depth training and practice with the techniques. Because of this and because of Enlace's emphasis on "products," the end result was considered more important than the process. While all students participated in the research and early production stages, it is not clear that all students took ownership of the final products. Another gray area was whether these materials were being designed for distribution in print, CD, or web format. Since this distinction was not made clear, many of the projects were quite impressive on screen (for example PowerPoint presentations with 100 full color slides), but too costly to reproduce in print format.

Despite the short time frame (five months from initial planning to finished CDs), the project was considered by all to have been a success. As a collection, the materials hold a vast amount of information about the Quiché region, much of which may never have been published elsewhere. The wide student and teacher involvement has prepared many to replicate the process. Many teachers have already made plans of how they will use the created materials in their courses during the upcoming school year. Others have drawn new ideas from the work of their colleagues and are planning new projects to do with their students. To showcase this project, students and teachers presented their work to top-ranking Ministry of Education officials and USAID representatives. These authorities were very impressed by the quantity, quality, and diversity of projects carried out in such a short time period.

### **3. Use and impact of the created materials**

During Phase II, Enlace was specifically tasked with distributing and applying materials created in Phase I and Phase II. Enlace worked to do this in CETEBI-equipped schools, in other schools, and with other institutions. Staff focused on making the link between classroom activities and computer-based activities. Enlace's field experiences during the 2003 school year provide much information as the potential impact these digital materials hold as well as the works that still needs to be done to achieve it.

Print materials created in the CETEBIs are already being used methodologically in rural primary schools in the region. During Phase II, Enlace distributed 2800 copies of the *Blossoming of our grandparents' words* oral tradition storybooks created in the CETEBIs during Phase I. This distribution was made to schools that receive student-teachers from the CETEBI equipped schools and these student-teachers received a workshop on how to effectively use these books in class.

After Phase II, it is clearer than ever that teachers in the teacher-training high schools face many challenges to their effectively using digital teaching materials in their work. Teachers are hampered by a knowledge-centered curriculum, average class sizes of 45 students, 35 minute (sometimes shorter) class periods, and limited access to the CETEBIs. Further, most teachers have teaching jobs in other schools and generally come to the teacher-training school just to cover their periods and then leave. They simply do not have the time to be in the CETEBI outside of their class periods.

However, with the dedication and creativity of a number of motivated teachers, ways can be found to make good use of these materials. One example is the use of the *Illustrating our words* CD, produced in Phase I. Enlace required each CETEBI administrator to make the 3,000 Mayan clip art images contained in this CD available on the CETEBI network with a direct access shortcut on the desktop of every computer. As a result, many schools began to use this clip art instead of the standard Microsoft images.

Enlace sees much more potential for deep integration of the technology in the mini-CETEBI equipped primary schools. Teachers are helped by smaller class sizes and being with the same class all morning. Teachers can begin a lesson in the classroom, take the students to the CETEBI for reinforcement, and finish the lesson in the classroom, potentially all in the same day. Even though the CETEBIs were installed late in the 2003 school year, Enlace detected a systematic use of the *Jun E* and *Let's broaden our thinking* CDs as well as Microsoft Paint. As the teachers and students gain more skills in computer use, it is likely that they will make effective use other Enlace materials as well.

Enlace also strove to make its materials known to the Ministry of Education and other NGOs. By participating in conferences and inter-agencies networks, Enlace distributed its materials widely. Widespread use of these materials cannot be expected due to the lack of computer centers in most schools. Further, most of the materials are language-specific, which limits their use in other parts of the country. However, the Ministry of Education and other NGOs have reproduced and distributed selected Enlace materials at their own cost.

#### ***D. ebiguatemala virtual community***

During the project planning stage, Enlace was asked to build a “network” of bilingual intercultural education practitioners in the country. Enlace was left to decide what this network would look like. With a recently installed dedicated Internet connection in the office and the promise of connectivity in the CETEBIs, plans for the network turned into plans for creating a virtual community, replete with its own portal. Enlace saw this virtual community as a space for sharing resources, ideas, and news among the students, teachers, and professionals in the country. These participants would have a sense of community on the web, while having an easier time finding and sharing resources.

In retrospect, this initiative was overly ambitious considering the limited time and resources that Enlace had available under Phase II. No funds had been allocated for software purchase or hiring a consultant or firm to design the portal. The six-member technical staff were also spread thin. Over the life of Phase II, the bilingual education coordinator and materials creation coordinator took on direct responsibility for the portal



and virtual community, dedicating an average of not more than one-third of their time to this result. Despite these

limitations, Enlace was able to meet its goal and end Phase II with an inter-institutional virtual community and a portal full of resources. Although the virtual community still needs great nurturing, it has reached a level of sustainability and build momentum that will continue.

From the beginning, Enlace knew that a virtual community and a web portal are not the same thing, but this distinction was too abstract for many potential partners. Enlace held an initial analysis session with 25 potential stakeholders, including representatives from government and non-government organizations. Their input helped Enlace identify needs, opportunities, potential key players, and challenges. It also got buy-in from the participating individuals, and in many cases, the backing of their organizations. In this session, the name of the portal and virtual community was chosen.

In response to the enthusiasm of the participants, Enlace staff tried to provide virtual follow-up to the meeting. There was little participation, however. Enlace felt it best to move forward, developing and launching the portal as quickly as possible. Thanks to the strong technical skills of the Enlace materials creation coordinator, the portal was developed in-house and put online in less than three months.

With a working virtual space, Enlace renewed its effort to draw individuals and institutions into the virtual community. A high-profile launch event with media coverage and the presence of the vice-minister of education generated excited about the portal. Attractive posters and bookmarks were printed and distributed to potential stakeholders, including every bilingual teacher in the country. Teachers in all of the CETEBIs were oriented to the ebiguatemala site.

This promotion generated interest, but also left Enlace with many challenges, especially as to how a virtual community could be built around the portal, and maintained after Enlace's financing ended. At this time, Enlace retook the idea of building an inter-agency coalition to manage and support the virtual community. Enlace organized this inter-institutional council, ending up with commitments from three government and four non-government organizations.

**Figure 11**

[www.ebiguatemala.org](http://www.ebiguatemala.org)

- Developed with: EzPublish (open-source, Linux platform)
- Major sections: news, library, discussion forums, surveys
- 251 resources available
- 146 links to other sites
- 142,000 hits/month
- 20,000 pages served/month
- 143 new visitors/month
  
- Administered by: [www.ebiguatemala.org](http://www.ebiguatemala.org) Inter-institutional Council (OKMA, DIGEBI, ALMG, Enlace, PLFM, CNEM, FODIGUA)
- Vision: *To be an educational, informative site where visitors share experiences, ideas, resources, and news from the nations that coexist in Guatemala.*
- Mission: *The ebiguatemala virtual community is framed in the peace process and construction of harmony among the nations, strengthening values and respecting differences. It's mission is to create a virtual educational space for interchanges, dialogs, proposals and permanent debates relating to multicultural, multilingual, and intercultural education in Guatemala.*

The ebiguatemala council faces many challenges to maintain and strengthen the virtual community. Fortunately, the members have begun to take ownership of the initiative and are dedicating time and resources to ebiguatemala. OKMA has offered half of their programmer's time to do all technical support for the portal. DIGEBI financed the hosting for 2004. This support is encouraging, but the council needs to seek more buy-in from organizations, especially from government. Ideally, the Ministry of Education, Mayan Languages Academy, and Indigenous Fund (FODIGUA) could assign staff or other resources to support ebiguatemala. With a new national government taking office in early 2004, the council plans to lobby for more direct support while seeking funds from international donors.

The council has recognized that much work must also be done to build the resource library and user base. Many links to national and international resources need to be added and better indexed. Other resources from around the country that are unavailable online need to be digitized and uploaded. Teachers and students need to be exposed to ebiguatemala and learn how to make the link between classroom activities and the available resources. The Enlace Quiché NGO and PLFM are negotiating funds to work in these areas. Among other activities, these funds will be used to staff one or more facilitators who will combine direct and virtual methods to encourage more participation in the virtual community. To draw in and keep a user base, ebiguatemala needs a dynamic facilitator who will see that the virtual community is always fresh and interesting. This will include posting news items, facilitating mailing lists and leading discussions.

A further challenge for the virtual community is to build horizontal communication between teachers, students, and other bilingual education practitioners. During Phase II, this communication was common among CETEBI administrators, but did not reach the critical mass of teachers or students who could potentially exploit connectivity in a variety of ways. Enlace envisions, for example, class projects with e-mail exchange in Mayan languages between students in different schools. Building the skills and habits for this type of communication is a major objective for the Enlace Quiché NGO under its financing from Microsoft.

## ***E. Capacity building and forming human resource***

Enlace was tasked under Phase II to build “a cadre of education technology specialists and technically knowledgeable professionals” that could continue on the work begun by the project. Considering the short lifespan of the project, this was a critical objective to allow for sustainability. This was also a major challenge considering the large number of project stakeholders and the generally low skill levels with which many began their training. Nonetheless, Enlace employed creative strategies and was able to help many stakeholders cross the threshold to where they have enough skills and self-confidence to continue learning on their own.

### **1. Partnership with New Horizons / Microsoft**

When Enlace began negotiating support from Microsoft Corporation, the project decided to request Microsoft-certified training for stakeholders. Late in 2002, Microsoft

granted Enlace \$30,000 in training, which translated to 72, 8-hour courses for up to 25 participants each to be held in Enlace’s centers. The courses were carried out by New Horizons Corporation, one of Microsoft’s certified training partners.

**Figure 12: Training provided through Microsoft’s grant**

<i>No. of 8-hour courses</i>	<i>Timeframe</i>	<i>Courses</i>	<i>Participants</i>
14	May to Aug. 2003	Intro to the Computer, Windows, Word, PowerPoint, Train the Trainer	75 CETEBI administrators, teachers, and students
16	Nov. 2003	FrontPage, Computer maintenance and repair, Center administration	25 CETEBI administrators and select members of the technical teams
14	Nov. 2003	Intro to the Computer, Windows, Word, PowerPoint, Train the Trainer	20 teachers from schools with mini-CETEBIs

This training was key to building a critical mass of trained individuals. The courses were intensive and highly motivating for participants. The courses were “Microsoft-certified” and imparted by polished trainers who provided training manuals and diplomas for each course. The participants felt privileged to receive a training in their local communities that is normally only available to executives in Guatemala City. Emiliano Santay, a student from Santa Lucia Uatlán, said “*Thank you for letting us receive the same opportunities that others have and show that we too are intelligent.*”

## 2. Enlace-led trainings

The New Horizons training covered the basics of computer operation, but Enlace had to provide many other specialized trainings. These trainings served to make the centers more sustainable while making a tighter link between technical skills and the bilingual intercultural focus of the centers.

Enlace trained center technical teams in the administration and support of their centers. This included how to keep the networks and Internet connections functioning. In all Internet-related trainings, project staff and consultants promoted ebiguatemala as a key resource site. Administrators learned the basics of video editing, working with footage from cultural festivals they held in their schools, sponsored in part by Enlace.

**Figure 13: Summary of major trainings**

A total of 1,954 students, teachers, parents, and partners were trained by Enlace during Phase II. Some of the more significant trainings include:

- 170 teachers received basic training in the CETEBI model of technology applied to bilingual intercultural education.
- 86 parents received a 20-40 hour introductory computer course.
- 294 student-teachers were trained in the use of the storybooks “Blossoming of our Grandparents’ words” and 2800 of these books were distributed to the schools in which they do student teaching.
- 141 teachers received an introduction to Internet, featuring the ebiguatemala portal
- 32 teachers received a course in integration of Internet into the teaching process.

### **3. How much capacity was built in the CETEBIs?**

As of the close of Phase II, it is difficult to prove how much capacity was actually built in the CETEBIs. As the 2004 school year unfolds with only limited assistance from the Enlace Quiché NGO, each school will show its skill levels. However, current signs suggest that the schools are well-prepared to maintain and use their centers.

The technical team strategy appears to have worked very well. The technical teams were nominally formed by the center administrator, two teachers and three junior-year students with at least two females on the team. The exact makeup varies from CETEBI to CETEBI and members have changed over time. However, in all schools the center administrators have found strong support from the team members. The teams help provide technical assistance to other students and teachers, help with maintenance, and even give classes and manage the center in the administrator's absence. The technical teams have also helped the centers in the cases of weak administrators or changes in personnel. For 2004, the teams should be even stronger since the juniors will return as seniors. However, it will be important that they incorporate younger students to take the place of those who will graduate. All who have watched the technical teams expect that many of the future CETEBI administrators will be trained through participation in these teams. The Enlace NGO plans to concentrate its training efforts on these teams.

The skill levels can also be seen across the board. School principals are beginning to communicate with Enlace and others via e-mail. Each school has a number of teachers who are implementing student projects and have generally good skills in computer applications.

### **4. Building capacity in partner organizations**

As described in section C, the CDs produced in Phase II were done directly by partner institutions with training and technical support from Enlace. In each organization there have been clear indications that they now have the interest and capability to produce new digital materials.

OKMA has now “gone digital” in the words of Uta Lausberg, who coordinated creation of the virtual guide for Mayan translators. They have retained the programmer they hired to help create the virtual guide and are using him to support the ebiguatemala web portal and to develop an online database of translations for Mayan languages.

The Mayan Languages Academy has expressed interest in working with other linguistic communities to create digital materials for language learning. They would like to use the CD created with Enlace as a template for other projects.

PAEBI has also continued to support the mini-CETEBIs and plans to provide more digital materials and more training for 2004. PAEBI also plans to open seven new mini-CETEBIs. They have identified needs for digital materials that would be well-received, such as a Mayan math program. However, it is not clear if they will have sufficient funds or time to embark on such a project.

## ***F. Impact beyond Quiché***

As Enlace has begun to generate models that can potentially be scaled up nationally and replicated in other countries, it has become increasingly important for Enlace to begin to help the Ministry of Education and other interested organizations incorporate these models into their strategies. Since computers and Internet are still generally seen as a luxury for schools rather than as cost-effective learning tools, educational planners are hesitant to make ICTs an integral part of any strategy. Nonetheless, these planners and educational leaders also are aware that ICTs are “the way of the future” and recognize the value of including them in their plans. Interest in Enlace has extended far beyond the borders of Guatemala as well.

### **1. National impact**

During Phase II, Enlace maintained good communication with the Ministry of Education. Enlace kept high-level ministry officials abreast of its activities by inviting them to inaugurate the ebiguatemala portal and attend materials presentation events. This helped these national and regional officials understand and take ownership of Enlace’s work. In these events and on other occasions, these officials promoted the importance of technology in the educational process. However, this buy-in was not likely to lead to real actions, considering the scarcity of resources and the fact that the elections at the end of 2003 were almost certain to bring a total change of Ministry officials, with ensuing policy changes.

Enlace felt that impact was more likely by participating in key national initiatives that appeared to have possibilities of getting buy-in from the Ministry in office at the time and the new Ministry which took office in January 2004. To this end, Enlace participated in a number of processes, coalitions, and conferences. Thanks in part to this projection, incorporation of ICTs into the educational process is becoming fashionable, at least in the ongoing discourse around education in Guatemala.

**Figure 14**

#### ***Key indicators of national impact***

- DIGEBI has taken the vice-presidency of the ebiguatemala council and funded the hosting of the portal.
- DIGEBI has reproduced Enlace CDs and distributed them to in-service teachers and teacher trainers.
- Enlace is one of the participating institutions in the process to design a new bilingual teacher-training curriculum being organized by the National Mayan Education Council (CNEM)
- Enlace was included in REDIEG, a network of successful educational innovations in Guatemala organized by the Rafael Landivar University.
- The Ministry of Education filmed a teacher training video on ICTs in education, which featured the work and materials of Enlace Quiché.

## 2. Impact beyond Guatemala

Over the course of Phase II, many organizations outside of Guatemala have shown interest in Enlace's work. Within Central America, Enlace is recognized as a leading initiative in local content creation. It has also been recognized by indigenous groups throughout the Americas as a leader in applying ICTs to indigenous education. Examples of this impact are shown in the figure 15.

Enlace has tried to position itself as the conduit between its local partners and the interested parties, rather than putting itself in center stage. Enlace staff have made a conscientious effort to let the teachers, students, and partner organizations show through in these international projections. It has also shared these projections with the local partners in hopes that they will be inspired and motivated upon seeing the wide-reaching interest in their pioneering work.

**Figure 15**

***Key indicators of international impact***

- The Plan Puebla – Panamá's telecommunications activities are looking to Enlace Quiché for leadership in areas of ICTs and indigenous populations and local content production.
- Enlace was included as part of the RECADO network (Central American and Dominican Republic network for ICTs in development.)
- The Institute for Connectivity in the Americas sponsored Enlace's participation in the World Summit on the Information Society (WSIS) and pre-summits.
- The Institute for Connectivity in the Americas included Enlace in a video it produced for WSIS on indigenous populations and development in the Americas.
- UNESCO asked Enlace to participate in a roundtable at WSIS on "Language, Literacy, and New Technologies."

## **G. Sustaining the project: the Enlace Quiché NGO**

Over the four years it has existed as a wholly-USAID funded project, Enlace Quiché has continued to catch the attention of ever more organizations around Guatemala and around the world. It has built a niche for itself as an innovator in the use of ICTs by indigenous populations, developing the CETEBI model and a critical mass of indigenous teachers, students, and education professionals that support it. It has built internal expertise in local content creation while challenging and helping other institutions use ICTs to bring a new dimension to their work. In doing so, it has embodied many of the principles found in the declaration of the Global Forum for Indigenous Peoples and the Information Society<sup>4</sup>, offering a working, albeit imperfect, model of indigenous people helping each other to use ICTs to solve problems and achieve goals. All of this made the transition from project to local NGO a natural next step.

Once the NGO creation became the official exit strategy for the project, Enlace began an accelerated process to establish the NGO. The local project director had settled permanently in Quiché well before the Enlace Quiché project began and was committed to continuing what he and others had begun. Many local leaders in bilingual education and community development also expressed support for the organization and committed to help the transition. The group was quickly formed and rallied around this opportunity to keep the momentum of Enlace going.

Enlace purposely used this transition to broaden its focus by creating new programs in areas in which it had not worked. The Enlace bylaws and strategic plan include programs in gender equity, investigation, and social communication. The NGO members see tremendous future opportunities to apply the Enlace infrastructure, including the CETEBIs, to these new areas.

USAID, Academy for Educational Development (AED), Microsoft Corporation, WorldLinks, the Inter-American Development Bank (IADB), and INFOLAC/UNESCO are some of the international organizations that have pledged support for Enlace. Thanks to USAID's donation of office equipment, furniture, and a vehicle, Enlace has the basic resources to implement projects. Further, USAID will finance three small projects that will be carried out in the upcoming months by the Enlace NGO. AED has provided business

**Figure 16**

### ***The Enlace Quiché NGO***

- Name: Asociación Ajb'atz' Enlace Quiché
- Members: Eleven leaders in the Quiché region in bilingual education and community development
- Board: Six "bearers" who will rotate every two years.
- Mission: Reach the full potential of human capacity through the use of information and communication technologies adapted to the local culture.
- Programs: Bilingual education, Human capacity building, Institutional strengthening, Gender equity, Investigation, and Social communication
- Web page: [www.enlacequiche.org.gt](http://www.enlacequiche.org.gt)
- Contact : Andrew Lieberman, [andy@enlacequiche.org.gt](mailto:andy@enlacequiche.org.gt)
- Location: Santa Cruz del Quiché, Guatemala

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<sup>4</sup> Geneva, December 8-11, 2003.

development funds to build Enlace as a key resource partner for future joint projects with AED. Microsoft Corporation has awarded Enlace with a \$75,000 grant and pledged to continue providing licenses. WorldLinks has expressed its intention to make Enlace its local partner for its entry into Guatemala during 2004. The IADB has included Enlace as a key partner in the telecommunications component of the Plan Puebla-Panamá initiative. INFOLAC has also budgeted a small grant for Enlace to pilot an activity in multilingualism and Internet.

While the combined amounts of these grants will not equal the budget that it had under USAID's funding, it will certainly be enough to keep its momentum going as it seeks new, larger projects. Most importantly, these small, well-designed activities will have specific impacts that will add tremendous value onto the infrastructure and human resource that Enlace has built up throughout the past four years.

## VI. Counterpart

As a cooperative agreement, Enlace was required to find and report counterpart from non-USAID sources. Aside from being a requirement, counterpart was much needed to help the limited project budget go further. This counterpart did complement the project funds, while getting more buy-in from local stakeholders. However, the task of documenting some of the counterpart was tedious and took resources away from technical activities.

When designing the program, Enlace expected to document counterpart from three sources. The principal counterpart was expected to be from the existing and new CETEBIs. These beneficiaries covered many costs related to the installation and functioning of the centers. Another source would be the partner institutions with whom Enlace would create materials. These partners would provide staff time, office space, equipment, and more. A third source would be private sector support.

USAID had recommended that Enlace reach \$250,000 in counterpart (25% of USAID's investment,) although the agreement only required \$212,910. Thanks to Microsoft's support with software licenses, Enlace was able to far surpass this amount. Further it was able to choose partners according to best fit, without having to make documentable counterpart a prime selection criterion. Also, the project was saved the tedious task of documenting much of the small, although significant, counterpart that local partners provide. The reported counterpart is summarized in the following table.

**Counterpart for Enlace Quiché, Phase II**

Counterpart source	Expected counterpart		Actual counterpart amount		Notes
	concept	amount	concept	amount	
CETEBIs	facilities improvement, personnel, connectivity, maintenance, supplies, equipment, rent	154,650	facilities improvement for new CETEBIs, operating costs for existing CETEBIs	65,067	These costs were only documented through June 2003 and under-represent the total contribution. Due to poor record keeping in the centers and hesitancy to share financial information, documenting these costs was very tedious.
Partner orgs.	staff time for training and projects, facilities for workshops, office costs, materials publishing	43,150	not documented	-	These costs were not documented because the Microsoft donation made it unnecessary. Further, two of the partners (OKMA and PAEBI) were matching Enlace's funds with USAID dollars.
Private sector	donated equipment	15,110	training and Windows and Office licenses	341,880	World Computer Exchange match was disallowed by USAID.
<b>Totals</b>		<b>\$212,910</b>		<b>\$406,947</b>	

## **VII. Replicability and taking to scale**

As Phase II of Enlace comes to a close, the timing is right for other donors and the Ministry of Education itself to begin to take on the challenge of replicating and scaling up the Enlace models. Computer hardware costs are at an all time low in Guatemala, with full systems available for under \$400. Competition in the connectivity market is forcing prices down while improving available bandwidth. More and more professionals in rural areas have solid ICT skills.

Infrastructure alone will not be enough to spread the Enlace model. The teachers, students, parents, and local organizations must see the introduction of this technology as a means to end, as a tool for improving educational quality and offering an education with cultural and linguistic relevance to the learners. This will require the hands-on, personalized support that Enlace has given its partners. To scale up, it will be necessary to build capacity in more organizations around the country and around the region that have the mix of skills to promote and support the CETEBI model, materials creation projects, and the effective use of a virtual community.

### ***A. CETEBI model***

The CETEBI model offers a relatively simple, low-cost model to install a technology center. Moreover, it provides many elements that ensure that the center's focus will be on using ICTs to support pedagogic goals in the context of the local language and culture. For the center to be successful and be more than just a "computer laboratory," these elements should be taken into consideration:

- The CETEBI should be operated by a school or other local organization with an established commitment to bilingual intercultural education. Since the organization's leaders will already be committed to and focused on bilingual education, they will intuitively seek new ways to use the CETEBI to support their institutional missions.
- The CETEBI must have an administrator who is technically proficient in keeping all the equipment functioning, while sharing his or her knowledge and supporting the bilingual intercultural focus of the center.
- The CETEBI should have a fixed user base (for example, students) that guarantees a set number of hours per week of use and a minimum income for covering operating costs.
- Connectivity should be included wherever it is economically feasible. In rural areas with small user bases, the mini-CETEBI model can still offer much to the communities, even without connectivity.

- Center administrators should monitor new wireless options for sharing connectivity. These systems could be used to make the CETEBIs a local Internet service provider.
- Local organizations must work with the CETEBIs on administrative, technical, and pedagogical issues if the center is to reach its full potential. In Guatemala, organizations such as the regional offices of the Mayan Languages Academy, private NGOs, or the regional Ministry of Education offices could take on this role. They would, however, need to build this capacity and have the assurance of resources to follow up on the actions.
- CETEBIs should be seen as training centers, research centers, and materials production centers. They should have the capability to provide local students, teachers, and community members with a basic skill level in computer and Internet use. Further, they should have the equipment and technical expertise to allow teachers and community members to produce research and materials creation projects of sufficiently high quality for local use at a minimum.
- To make a better integration of the CETEBI and classroom courses, CETEBIs will need continued training and support from organizations such as WorldLinks that can provide proven methodologies for making this connection.

### ***B. Materials creation***

Creating locally relevant materials is best done at the local level. It requires individuals or teams with the combined vision, linguistic skills, pedagogic skills, and technical abilities. It cannot be done from the top down or from the outside, regardless of whether the end product is in print or digital format. To scale up this type of production and enable each linguistic group to begin to build a large base of quality teaching materials, institutions such as the Ministry of Education must continue to decentralize and build local capacity in materials creation. In addition to building this capacity, central organizations must give resources to local offices to cover the costs of equipment, staff, and reproduction. The Mayan Languages Academy has taken strong steps in this direction by decentralizing much of its control and providing each linguistic community with more resources and more control over the projects it chooses to implement.

### ***C. Virtual community***

The ebiguatemala virtual community was designed to be a strong national initiative. Since its inception, Enlace and the other stakeholders have sought high-level government support as well as buy-in from donors and NGOs around the country. If Enlace had been designed as a longer project, it likely could have achieved this scaling up during its implementation. Ideally, the start up should have been slower and more participatory. Enlace should have formed the council from the start and sought more long-term commitments from the Ministry of Education, other government dependencies, NGOs, and donors. To do this, Enlace could have designed a live prototype portal and worked with

these other institutions to build the commitment to bring the virtual community to scale. This would have taken at least a year, if not the whole life of Phase II.

Nonetheless, ebiguatemala can still reach its potential. The council that oversees it includes high level, national representation from the Ministry of Education and the Mayan Languages Academy, making it clearly a national initiative. The site design can also include 4,000 or even 40,000 resources just as easily as it currently holds 400. The challenges that face the council are to find ways to channel more resources to the virtual community and to get permanent commitments for its sustainability. To do this, ebiguatemala must be promoted as something that complements the Internet presence of each institution, rather than being seen as a substitution or competition.

The council will have to work actively to draw ever more members into the virtual community. The council members need to prove that participation in ebiguatemala is indispensable to keeping current in Guatemala's bilingual education field. The council must show how easy and instant it is to disseminate news and resources via ebiguatemala. Moreover, the council must show that an ever-growing critical mass of bilingual education practitioners are getting their information from ebiguatemala. Simultaneously, the council must make students, teachers, and organizations aware that ebiguatemala exists and the resources it holds. These users also may need to be made aware of the cost-effectiveness of using ebiguatemala rather than other means of getting information. Since Internet skills are generally low around the country, the council must take a train-the-trainers approach to building this potential user base. These trainings must be complemented by pro-active outreach from ebiguatemala to the user base. This must include e-mail alerts when new resources are available. Further, it should include other types of special events such as on-line conferences and courses.

## VIII. Conclusions

This report closes the second chapter in the chronicles of Enlace Quiché. Enlace has continued to evolve in the last two years, learning from the past and seizing new opportunities as they have arisen. Enlace has built a critical mass of CETEBIs, materials, teachers, students, and partners. This human and technological infrastructure will help Enlace to keep reaching more and more people around Quiché, around Guatemala, and around the world. Indigenous languages and cultures face tremendous challenges to survival in the modern world, with ICTs being a leading source of competition to local traditions. Enlace, however, is showing more and more people that ICTs can also be a key tool for the revitalization of any indigenous group in any country. The Enlace model proves that indigenous peoples can bring their culture and language into the global world.

As this chapter closes, a new chapter in Enlace's life has already begun. The Enlace Quiché NGO faces challenges to build on the momentum while gaining experience in fundraising and managing simultaneous projects from a variety of donors. However, Enlace is also encouraged by its prospects. A new government will give Enlace a fresh opportunity to get national buy-in. Lowering connectivity costs, a TV channel donated to the Mayan Languages Academy, and telecenters being installed by other organizations will offer infrastructure for Enlace's materials. The Mayan University will help form more indigenous professionals who can build on the Enlace experience. Regional projects will help Enlace share its models while bringing in new ideas, resources, and partnerships.

In the upcoming months and years, Enlace's goal remains the same: to be the link between Quiché's indigenous and the new technologies and resources that can help their development while strengthening their culture and language. This will only be possible to the extent that the local indigenous take ownership of these technologies. From a look at the sheer number and commitment of students, teachers, parents, and professionals who collectively are Enlace, it appears that this ownership will soon become the norm rather than the exception.

## IX. Attachments

### A. Compliance summary

This final report was written to a broad audience of project stakeholders and others who could potentially be interested in the work of Enlace Quiché. Therefore, the presentation of actions and impacts was organized thematically and little specific mention was made of the official expected results from the program description. Enlace was able to meet all of its expected results. The following table summarizes how each result was met.

<i>Expected result</i>	<i>Key compliance indicators</i>
<b>Result 1.1:</b> At least seven (7) new "Enlace Quiché" Bilingual Education Technology Centers of Excellence are established in El Quiché or neighboring areas.	<ul style="list-style-type: none"><li>• Seven new CETEBIs were opened, all of which fulfilled the obligations in the agreements signed upon being selected.</li><li>• Additionally, Enlace opened 8 mini-CETEBIs in cooperation with PAEBI/World Learning.</li></ul>
<b>Result 1.2:</b> Ongoing technical support is provided for 12 or more centers (the 5 current centers plus at least seven (7) additional).	<ul style="list-style-type: none"><li>• Six-member technical teams made of students, teachers, and the center administrator were strengthened to fully administer and sustain each center through specialized trainings and ongoing support.</li><li>• 170 teachers received basic training in the CETEBI model of technology applied to bilingual intercultural education.</li><li>• 120 students, teachers, and center administrators received intensive technical training (14+ 8-hour courses) in software applications and center administration.</li><li>• 141 teachers received an introduction to Internet, featuring the ebiguatemala portal</li><li>• 86 parents received a 20-40 hour introductory computer course.</li></ul>
<b>Result 2.1:</b> To improve their quality and utility, materials created under LearnLink are revised, finalized, distributed and applied and new materials are produced.	<ul style="list-style-type: none"><li>• A survey of use of the LearnLink materials was carried out.</li><li>• 294 student-teachers were trained in the use of the storybooks "Blossoming of our Grandparents' words" and 2800 of these books were distributed to the schools in which they do student teaching.</li><li>• 45 school-based teaching materials were created in the CETEBIs and published in Internet and on CD</li></ul>

<i>Expected result</i>	<i>Key compliance indicators</i>
<p><b>Result 2.2:</b> Partners have increased capacity to create instructional materials through the application of ICT.</p>	<ul style="list-style-type: none"> <li>• Enlace built capacity in three carefully selected partner institutions, helping them produce a total of six CDs.</li> </ul>
<p><b>Result 3.1:</b> A network of bilingual teacher-training centers is established to allow teachers to learn from each other, as well as from experts.</p>	<ul style="list-style-type: none"> <li>• Enlace created the <a href="http://www.ebiguatemala.org">www.ebiguatemala.org</a> virtual community, administered by an inter-institutional council made up of government and non-government organizations. This portal receives an average of 142,000 hits and 143 new visitors per month.</li> </ul>
<p><b>Result 3.2:</b> Human capacity development improved throughout El Quiché and neighboring regions, through building a cadre of education technology specialists and technically knowledgeable professionals.</p>	<ul style="list-style-type: none"> <li>• 1,954 students, teachers, parents, and partners were strengthened by Enlace trainings in areas relating to bilingual education, pedagogy, technology, center administration, and materials creation.</li> <li>• Enlace formed a local NGO, “Asociación Ajb’atz’ Enlace Quiché” which will continue to build capacity in the region.</li> </ul>
<p><b>Result 3.3:</b> Dialogue undertaken with the Ministry of Education to extend ICT services and applications within national education policies and strategies and include Information Communication Technology (ICT) in the curriculum of local teacher-training schools.</p>	<ul style="list-style-type: none"> <li>• Enlace participated in national education reform processes, principally the CNEM-led design for a new bilingual teacher-training curriculum and the Rafael Landivar University-sponsored network of successful educational innovations.</li> <li>• Enlace obtained significant participation from Ministry dependencies (DIGEBI, UCONIME, Innovaciones Educativas, and the Vice-Minister) in the ebiguatemala virtual community.</li> </ul>

## ***B. Impact evaluation***

In early 2004, Rosa Amalia Barreno Vicente, conducted an impact evaluation study of the CETEBIs. This study was part of a supervised practicum for her degree in Educational Research at the San Carlos University. As of this writing, the study was still being finalized. However, in her survey of 700 students who regularly use the CETEBIs, some of the principle findings were:

- 68% consider the CETEBI course schedule appropriate.
- 70% consider the costs to use the CETEBI within their means.
- 66% consider the CETEBI an integral part of the curriculum.
- 85% consider the presence of a CETEBI in their community to be beneficial.
- 40% consider that the CETEBIs have sufficient information in the student's native language.
- 63% consider that the CETEBI has helped bilingual education in the community.
- 35% reported problems with the CETEBIs (lack of resources, lack of trained personnel, high cost for printing.)
- 28% are familiar with the Enlace-produced teaching materials.
- 57% use school created materials for assignments.
- 35% have participated directly in materials creation projects in the CETEBI.
- 64% use Internet for research.
- 32% use e-mail.
- 34% have visited the ebiguatemala web portal.
- 90% of the students who have entered ebiguatemala are satisfied with the information and materials they have found.

These numbers indicate a strong acceptance of the CETEBIs. However, they also indicate that the available resources (CDs and web resources) are still not reaching many students. The final results of this study will provide important baseline information for the Enlace NGO to design future interventions.

### ***C. Monitoring and evaluation report from NetAssessment, Inc.***

NetAssessment Inc., a US based company with a relevant background in Phase I of Enlace, was subcontracted under the prime EDC award to provide external monitoring and evaluation (M&E) for the Enlace Quiché project. NetAssessment has substantive experience in ICT applications related to technology centers and multimedia materials production in the context of a broad array of innovative development initiatives. The following pages summarize the evaluative findings, observations and conclusions gathered throughout a period of seventeen months. The full report and a multimedia report are available separately.

## Executive Summary

Under the terms of a dot-EDU Associate Award to the Education Development Center, (EDC) Enlace Quiché furthered the application of information and communication technologies to strengthen the training of intercultural, bilingual educators. Its program activities aimed at improving the outreach and quality of bilingual education to communities of Quiché and its neighboring regions. Enlace Quiché was mandated to provide both physical and technological infrastructure to teachers and communities and raised the level of education through training and curriculum development. Overall, the objectives of the project were to: (1) improve access to bilingual education and educational technologies for teachers and community members through the establishment of 12 fully operational Bilingual Education Technology Centers of Excellence, complete with technical support; (2) improve educational quality through teacher training in computer technology, bilingual materials production, and Mayan and local languages, as well as through establishment of a bilingual teacher training network; (3) develop ICT educational materials about Mayan language and culture; and (4) increase dialogue with and support from the Ministry of Education for the integration of bilingual education technology at the local, regional, and national levels.

NetAssessment Inc., a US based company with a relevant background in the first phase of activities in Guatemala under the LearnLink project, was subcontracted under the prime EDC award to provide external monitoring and evaluation (M&E) for the Enlace Quiché project. NetAssessment has also substantive experience in ICT applications related to technology centers and multimedia materials production in the context of a broad array of innovative development initiatives. The final report presented in the sections to follow summarizes the evaluative findings, observations and conclusions gathered throughout a period of seventeen months.

### ***Brief Background on the LearnLink Implementation Phase***

Consistent with its activities worldwide, LearnLink, a project administered by the Academy for Educational Development, AED (Global Communications and Learning Systems), signed a Task Order in January 1999 with the USAID/EGAT to better prepare future bilingual education teachers in the Quiché Department of Guatemala through the use of Information and Communication Technology (ICT) tools. The task order identified a variety of objectives, including materials creation in print, audio and CD-ROM for pre-school students; training of pre-service and in-service teachers; and ICT support for government entities, the private sector, and NGOs. The project aimed at strengthening the student teachers' Mayan language skills and their ability to teach in the local languages of K'iche' and Ixil and introduced them to computer technology, including basic computer literacy and multimedia production. Five teacher-training high schools in El Quiché housed educational technology centers where students could participate in a pre-service education program. Four of the centers were created by LearnLink (in Santa Cruz del Quiché, Joyabaj, Cunén, and Nebaj); the fifth center (in Pueblo Nuevo, Ixcán) was established by the USAID funded, Rafael Landívar University/EDUMAYA program with LearnLink technical collaboration.

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***Located in the western highlands of Guatemala, the Department of Quiché has a predominantly rural and indigenous population that was directly impacted by decades of civil strife and still lives amidst the aftermath of war. Consequently, years of systematic aggression, often resulting in forced migration, have brought about the abandonment of cultural traditions and rituals.***

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## ***Brief rationale and Approach for Monitoring and Evaluation***

The original LearnLink activity assumed a broad vision of ICTs being used in a wide variety of ways, holding a wide range of technical and logistic complexity. Performance indicators and a monitoring and evaluation strategy were not clear from the outset to those responsible for its execution. Consequently, certain key decisions were left to be made as the project unfolded, causing some activities to unnecessarily overextend. Hence, the M&E baseline for the dot-EDU activity under the EDC Cooperative Agreement with USAID/Guatemala considers a number of important aspects previously outlined by project and headquarters staff, consultants or key project informants under the LearnLink activity. These aspects relate directly to the three areas noted and, whenever possible and applicable, the progress-to-date made by the dot-EDU activity was compared to the baseline information.

All M&E efforts under the dot-EDU activity were geared to more systematically support and document the completion of pre-established benchmarks, significant program implementation junctures and ongoing impact. As a subcontractor to the EDC/dot-EDU Project, NetAssessment has worked in close consultation with the Project Director in Guatemala and has coordinated all field activities with project specialists and center managers, as well as project counterparts and the key staff of the participant schools. NetAssessment has submitted corresponding reports on findings, following each visit to the project.

### **What are the expected results from this initiative in relation to the broader dot-EDU activity?**

Results documented by the project point to both a newly established **local capacity** pivoting around the Centers of Technology that showcases a different approach to learning. A major portion of the program activities yielded **direct technical assistance**, embedded in the context of fifteen different locations throughout the Quiché Department in Guatemala. Moreover, there is a demonstrated command on the part of the senior project staff of often subtle differences in the community make-up of each location and the social forces at play in the dynamics of Center operations. The understanding gained by project staff regarding success factors and a sense of opportunity reflected in their interaction with key community and school based counterparts, extends significantly above the learning curve granted by LearnLink. Although more peer-to-peer interaction would have been desirable across a viable and sustainable network of fifteen Centers, important **horizontal collaboration** activities were leveraged against the original isolation conditions of the existing schools.

### **How do technology centers add to the quality of education and cultural pertinence?**

Final reporting of the senior staff<sup>5</sup> points to a marginal use of technology that directly impacted the classroom setting. A **lack of adequate training for the teachers** interacting with the Centers compounded by **the absence of a structured work plan**, substantially addressing technology competencies and

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<sup>5</sup> Specific Objective 1.2, Section 1, Final Submission, Jacinto de Paz 2003

effective appropriation among teachers, were cited as reasons for such low impact in the classroom. Staff reporting speaks to the need to find adequate space *and timeframe* where systemic use of technology can yield tangible improvements to the quality of education. Nevertheless, the project was able to compile a number of innovative products. The centers are certainly a newly founded capacity to explore and establish innovative forms of **distance administrative and pedagogical support** as well as new research and data collection strategies. Such activities can be now best supported through **the consolidation of an Internet-based network** sponsored through the EbiGuatemala Portal.

**What impact was actually achieved by integrating technology into the curriculum of participant schools in Guatemala?**

The construction of a new innovative learning culture associated with cognitive and creative uses of computers in schools was phrased by Enlace Quiché as a task of mainly the center administrators, program staff and those directly involved in program implementation. Materials produced and distributed to participant schools were central to providing both students and teachers with **new tools and approaches to honing bilingual reading/writing skills**. Workshops provided additional training and promotional opportunities for technology integration through a hands-on approach. However, given the time and staffing constraints of the second phase, a fundamental adherence required of the school officials, teachers, parents and other educational authorities was not systematically pursued. Enlace Quiche's ability to conduct its program activities within the specific environment and nuances of each center was severely limited by the arduous tracking of the operations of fifteen centers, most of them located in sites with difficult road access and requiring cumbersome logistics. Because center set-up and subsequent hardware/software support weighed so heavily in the time allocation of the Enlace Team, the vital teacher training activities were drastically curtailed. Consequently, the focus of center support was placed on the Center administrators and the technical support team, with marginal participation of teachers. Still, in most cases, the start-up profile of the administrator did not include critical skills in curricular and professional development within the context of an in-service teaching program.

**How do we effectively measure education quality enhancements brought about by the introduction technology?**

Materials production was the main thread to teacher involvement and thereon, their most important link to the requisite understanding and engagement of technology applications to the learning process. Materials were to serve a purpose that was twofold: (1) By providing interesting grounds for **skills training and specific use of the tools available** and (2) generating valuable products that could enhance **the ability of bilingual teachers to increase and improve the cultural relevance** of the curricular contents they delivered in the classroom. The process met relative success in the compilation phase of the production process, where student involvement facilitated the labor intensive tasks related to transferring of contents into digital format. Its completion though, required emergent corrective actions which had to be fully supported by project resources (mainly writing clarity and spelling check). As Enlace Quiché engaged the production of materials, it was not able to conceptualize parallel teacher-training development strategies through a process of inquiry and systematization based on field observation and the accrued experiences of teachers.

## ***Dot-EDU Implementation: New Centers and Ongoing Technical Support***

**Result 1:** Improved access to bilingual education technology centers for bilingual educators, students, parents and community members in Quiché and neighboring areas;

**Result 1.1:** At least seven (7) new "Enlace Quiché" Bilingual Education Technology Centers of Excellence are established in El Quiché or neighboring areas.

In stark contrast with the first phase of implementation, the selection and set-up of the fifteen new centers during the dot-EDU implementation phase was very much at the core of a useful learning curve and model evolution engaged by the project. The selection process featured a review of close to 50 applications resulting in 14 preliminary candidates selected to undergo further scrutiny, including a diagnostic and interview process. Selection criteria were successfully established and aspects related to the candidates' focus on Mayan culture, coverage and operating capacities were key in their final selection. Moreover, the strategic planning and preparation for center set-up provided a specific baseline for every center that was lacked during the first implementation phase. Team reporting on program activities discusses findings related to a useful learning curve on the part of center operators and stakeholders regarding policies and procedures that reflects a better understanding of how to engage their own particular learning environments.

### ***The need for a well defined and structured preparation***

#### ***Phase before Centers are set up for operations***

The team's findings and the corresponding evidence found in field visits to the centers point to the importance of the preparatory activities in securing both, sound and productive center operations in the short term and greater long term involvement of key stakeholders and counterparts. Following is a discussion of the main inferences under this topic:

- I. There is a certainty among members of the Enlace Team, also confirmed by the Center Administrator that, the more insightful and sensitive approach taken in reconciling conflicting interests within the community bestowed the project efforts with an important credibility and legitimacy. An interesting example of this concern is provided by the experience in Sacapulas, where local rivalries and other reservations regarding the stewardship of the proposed CETEBI led the project to support the establishment of a representative board. Indeed, the learning curve of the Enlace Team in terms of counterpart engagement appears significant, yielding a better integrated approach towards Center selection and set-up but, maybe more importantly, they were able to better tap into the social transformation forces, clearly outside of the more immediate targets of an initiative merely focused on technology adoption.
- II. Financial sustainability and accountability in Center operations is **not** a factor of the right business plan but rather a learning curve that often requires clear and relevant models at the outset and the subsequent follow-up and direct technical support and oversight to ensure the consolidation of processes and procedures. During the second implementation phase the Enlace Team was able to bolster the profile of the administrators through a better structured strategic planning exercise. Nevertheless, due and complete financial reporting continues to track an expectation of exemption associated with the general landscape of international assistance

initiatives. The Enlace Team has been able to render a useful understanding not only of the time allocation requirements of this learning curve but also of the qualitative differences that characterize the key role of the Center administrator.

***A different Approach to Equipment Procurement, a strategic partnership  
with Microsoft and the Cost Benefit of In-kind contributions***

An important difference from the LearnLink phase was the project approach, under dot-EDU, to hardware and software related procurement. This is not solely an administrative or operational difference in light of additional staff supported under the second phase. Following is a discussion of the main inferences under this topic:

- III.** Competitive pricing was paired with strategic partnerships within the business sector to enable a better spread of resources among 15 new centers. Serious delays were faced in the in-country delivery of the equipment, tied to a cumbersome freight forwarding process, alongside a slow customs processing. Both project beneficiaries and stakeholders underscored the great risk assumed by a project promoting new technologies inside the dynamic environment of a classroom or a center, where the equipment installed has a high chance of failure. While Enlace Quiché was able to compensate the hardware/software deficiencies of the procurement phase, the problems inherent to equipment malfunctioning will outlive the life of the project (LOP).

**Result 1.2: Ongoing technical support is provided for 12 or more centers (the 5 current centers plus at least seven (7) additional).**

The program activities under this result were principally undertaken by the two project teams engaged in Center Coordination and ICT Applications. It also featured important external counterparts in training activities, as was the case with New Horizons, INNOVA (Windows System and Office Tools) and Tres Torres S.A. (Internet hardware, software upkeep and troubleshooting). Training provided also featured a module for Center management, procurement policies and procedures, and general operations. The project privileged a more focused (and cost-effective) approach, working through a considerable number of workshops (21 workshops, 576 participants) that covered key topics of the Bilingual Education agenda. However, there seems to be an inherent inconsistency in this approach since no link was created with the Centers, thereby enabling administrators and their technical teams track the work engaged by the workshops. No evidence was reviewed that acknowledged the potential capacity of the Centers (as established nodes for sustained program activity beyond the LOP) to observe and benefit from any change and progress made by workshop participants in their respective classrooms and schools.

***Innovation to the original Center Model: MINI-CETEBIS***

An additional element encompassed by the complex set of program activities conducted by Enlace Quiché under this result was the establishment of technology centers in elementary school settings (also called mini-CETEBIs). Despite the setbacks faced with the correct operation of the donated equipment assigned to this activity and the important voids in the on-site follow-up

and support reported by the senior staff<sup>6</sup>, the mini-CETEBIs are an impressive accomplishment that surpassed the original level of effort and contract deliverables. Even if not adequately documented in the formal reporting, field observation enabled a first-hand appraisal of the project's collaboration with PAEBI. It's unique (both project-wide and across the landscape of ICT4D initiatives in Guatemala) mix of direct teacher involvement and corresponding materials production resulted in the more substantive observatory for a process of true integration of technology within a formal education setting in rural Guatemala. Its relatively smaller scale (as compared with the target population of the traditional centers<sup>7</sup>) and closer proximity to a bilingual classroom environment are key elements often not fully provided by the Centers.

## *User Survey*

The design and application of surveys was a task assumed principally by the EBI program component and undertaken as part of its scheduled activities throughout the LOP. Furthermore, the original M&E Plan contains a task distribution that relates specific program areas with indicators, and some of them in turn, are linked to survey actions. Surveys covering users of ICT applications in general and teachers as a special user segment were originally programmed to happen during the second and fifth quarters of the dot-EDU activity. Nevertheless, significant changes in the programming and sequence of the activities (including those resulting from implementation setbacks already discussed) led to changes in the survey scheduling. Beyond Enlace Quiché's greater or lesser ability to formally analyze and overlap feedback into useful and systematic outputs, the staff's learning curve and mature frame of reference is no doubt unique and central to the project's added value.

**Result 2: ICT materials created to support teacher professional development and improved educational quality**

**Result 2.1: To improve their quality and utility, materials created under LearnLink are revised, finalized, distributed and applied and new materials are produced.**

The need to provide teachers with adequate computer-use strategies, materials and organizational plans is essential to any program using information technologies with an innovative focus. Hands-on, concrete approaches that allow teachers to work with what they know – that is, actual educational contents – reduce the threatening feelings frequently associated with technological innovations, particularly when emphasis is placed on technical aspects. Relevant to these concerns and congruent with stated strategic results, Enlace Quiché undertook two key tasks: (1) the review and upgrade of materials from the LearnLink activity and; (2) the production of new materials based on collaboration with counterpart institutions. The initial survey covering the use of LearnLink materials revealed that a high percentage (74%) of those intended users who received materials had reviewed/installed the CD-ROMs and an even greater

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<sup>6</sup> Specific Objective 1.2, Section 3, Final Submission, Mario Torres 2003

<sup>7</sup> Specific Objective 1.2, Section 2, Final Submission, Cynthia Castillo 2003

percentage had used the printed products. Classroom-centered use of digital products was roughly half of that of printed materials. Enlace Quiché devised a balanced and sensible strategy towards the possible upgrade and re-utilization of the materials produced during the LearnLink activity.

**Result 2.2: Partners have increased capacity to create instructional materials through the application of ICT.**

Enlace Quiché engaged a different approach in new materials development in the context of the dot-EDU supported activities. While the LearnLink activity favored an intensive in-house approach to materials development (with a 19 month time-to-market span), the second phase production significantly increased time/cost efficiency by delegating all production responsibilities to three external project partners. An initial search for appropriate partners included 25 Guatemalan organizations with relevant activities in the Department of Quiché. Formal agreements and corresponding work plans were established with three organizations, outlining deliverables and other specific commitments including the requisite financial resources to support the production activities. The production approach featured full partner involvement throughout and mirrored a typical application development process, including (a) a needs assessment, (b) template design and code development, (c) testing and adjustments, and (d) a final production and distribution phase.

**Result 3: Increased impact of ICT on Guatemalan educational systems**

**Result 3.1: A network of bilingual teacher-training centers is established to allow teachers to learn from each other, as well as from experts.**

Under dot-EDU support, what had started as an effort to establish four (soon after, five) isolated centers of excellence, would now be the launching point of a network of bilingual teacher-training centers. Efforts were anticipated to build alliances with other USAID-funded education activities as well as other donor activities to promote the education reform process and specifically, the curricular transformation and professional development of teachers. The project was also tasked with the integration of initiatives and actors within the Ministry of Education, private and public teacher-training centers, key NGOs and university centers. Despite Enlace Quiché's best efforts, open information sharing practices and environments are not yet part of the organizational and professional culture of development actors in Guatemala.

The Internet Portal developed by the Enlace Quiché Team is impressive as compared to other portal efforts furthered in Latin America and relevant to a development imperative that is solely supported with project resources. Not only was it developed in record time with limited financial investment, but it was backed by a sound development/investment rationale (demand driven) regarding the growth of its user base in both the short and long terms. Hit numbers (averaging 142,000 monthly) and page views (20,000 per month) remained consistent through a seven-month segment of the 2003 school calendar. The portal has been able to document an average of close to 150 new visitors every month.

**Result 3.2: Human capacity development improved throughout El Quiché and neighboring regions, through building a cadre of education technology specialists and technically knowledgeable professionals.**

Under the dot-EDU activity, Enlace Quiché was expected to continue to provide technical support to the local education sector, especially to improving their understanding of ICT benefits in the education system. Original program requirements called for consultations with the local education offices (Departmental Directorate of Education and the Departmental Office of Intercultural Bilingual Education, and Municipal CTAs) and the provision of technical assistance and essential inputs (equipment and/or services). Enlace Quiché, was also expected to partner institutions in the centers and institutions or to the community at large. The project adopted a very successful approach to coverage that featured key partnerships (New Horizons, INNOVA, Tres Torres S.A.), greatly extending its outreach capacity and actual coverage numbers. High standards of quality assurance were thereby introduced to this area of program delivery. Cost-effective approaches were also used in the creation of training and reference materials for center staff. Training modules were validated with sufficient input from center staff and subsequently became a prime source of reference for teachers involved in the materials creation activities.

**Result 3.3: Dialogue undertaken with the Ministry of Education to extend ICT services and applications within national education policies and strategies and include Information Communication Technology (ICT) in the curriculum of local teacher-training schools.**

Enlace Quiché was expected to share lessons learned, results and outcomes of its efforts in bilingual education technology integration with the Guatemalan education sector at the national level. Likewise, the project was to engage in educational policy dialogue with MINEDUC at various levels, regarding the application of ICT to improve the efficiency and quality of education. There is an overall recognition by project staff that the noted advocacy role (one that actually would yield authorized curricular changes) was maybe too ambitious in light of time constraints and the lack of a feasible and relevant link to MINEDUC. Project activities did not significantly include MINEDUC beneficiaries, nor was the role of MINEDUC officials incorporated into the different threads of project implementation. Nevertheless, in terms of a *dialogue* (understood as a meaningful exchange that opens new grounds for close collaboration), it is clear that the EbiGuatemala Portal **did** provide interesting, albeit limited, new opportunities for engaging such dialogue with public sector authorities.

### *Selected Conclusions from an M&E Vantage Point*

- The range and breadth (and inherent complexity) of the program activities greatly outweighed both the financial resource allocations and proposed timeframes of the project. Two opposite-ended effects took place where, extraordinary results were achieved in areas such as portal and materials development, center diversity and a unique elementary school pilot experience. However, technical focus was diluted by difficult logistics and a seemingly “scattered shot” effect of a fifteen-center rotation;
- The center assistance model, while plagued by logistic hindrances, did maximize the utilization of the available project resources. Better coordination between the EBI focused activities and those aimed at upgrading and streamlining center operations would have possibly enabled more useful experiential knowledge. The accrual and translation of such knowledge into more incisive instrumentation for the classroom environments immediate to the centers would have provided a higher added-value in terms of necessary curricular review and enhancements to teaching practices;
- Valuable field experience, drawn from repeated first-hand contact with teachers and students as they progressively incorporated technology into their productivity, remained poorly documented and devoid of adequate feedback loops into ongoing project decision-making. In-classroom follow-up and support did not systematically occur and thus, the project lacked the more valuable knowledge to support and further curricular enhancements to EBI;
- Project partnerships evidenced a well balanced an effective mix of public/private scenarios for technology-driven educational initiatives. A sense of progress is highlighted in the recognition of valuable skills transfer, effective and relevant products delivered. A useful understanding of “next step” planning, design and implementation was conveyed by all three institutional partners;
- Cost-benefit aspects of certain program elements did not yield the expected results. Donated equipment that overburdens a small systems support staff and engulfs program management and administration in excessive public sector red tape should be avoided in the future. A more balanced approach in terms of coverage vs. the depth of program inputs must be favored. Overall program design and timeframes must more realistically consider actual access and protocol related to key actors and authorities in relevant public sector realms;
- Mini-CETEBIs offered a unique mix of direct teacher involvement and corresponding materials production. Inferences regarding optimum scale, depth and scope of observation and a closer program proximity to the actual bilingual classroom environment will be of critical importance to future program design;
- Surveys covering users of ICT applications in general and teachers as special user segment need to be better incorporated into mainstream program activities. Surveys relevant to the engagement of key actors and educational authorities seemed detached from other cross-referencing opportunities availed by other program actions. Surveys were not significantly useful in better profiling and mapping pre-service or in-service

perceptions and attitudes regarding ICT driven curricular enhancements, their appropriateness or their feasibility.