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ABSTRACT

This document presents an overview of the latest developments and trends in technology, along with current uses they are being put to for educational purposes, and the ways in which these can best serve education in this country and abroad. In doing so it explores the benefits of technology not just for bilingual learners, but also for teacher education, administrative planning and oversight, and parent involvement in the scholastic life of bilingual students. Issues covered include the following: equity of access; educational software; voice recognition technology; inexpensive devices for Internet access; the wireless Internet and Web; hand-held digital devices; e-books; scanners; educational Web portals; machine translation; pop-up translation, video, and audio; and the new technology billionaire-funded philanthropy. It is concluded that there is a lot of potential in these new technologies for language learning and teaching. Numerous links to a variety of useful Web sites appear throughout the text. (KFT)

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Technology Trends and Their Potential for Bilingual Education

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New developments in technology and its use in education hold a promise of better, faster and more equal access for bilingual learners. That is the good news. The bad news is that the "promise" may well pass us by as producers of these technologies make the same mistakes as generations of producers of older technologies, such as education publishing at its inception.

This Issue Brief presents an overview of the latest developments and trends in technology, along with the current uses they are being put to for educational purposes, and the ways in which these can *best* serve education in this country and abroad. In doing so, it explores the potential benefits of technology not just for bilingual learners, but also for teacher education, administrative planning and oversight, and even parent involvement in the scholastic life of bilingual students.

Equity of Access

Before starting on the detail of the newer technologies, let us briefly consider the older technologies and the fact that the "digital divide," "information gap," and what is called "digital desperation" [1] are still growing. Note these facts:

- Alhough 94% of households in America have telephones, half of the female headed households below the poverty level and close to half (43.5%) of the families on public assistance are without this basic technology.
- In 1998, African Americans and Hispanics lagged even further behind in access to technology than reported in the 1994 National Telecommunications and Information Administration's study;[2] however, these differences are accounted for primarily by income rather than by race or ethnicity.

(Roblyer, 2000)

The equity picture for educational technology is more complicated than just how many individuals or schools have computers. Both rich and poor schools are, in fact, coming closer in terms of computer access (student-to-computer ratio). At the same time, "when it comes to computers that are connected to the Internet, inequities reappear" (Jerold & Orlofski, 1999, p. 58).

By informing educators of the potential uses of technologies for bilingual learners, we hope to help reconstruct the fibers of the infrastructure that has led to these sorts of inequities and narrow the digital gap. The remainder of this Issue Brief discusses the latest advances in educational technology in this light.

[1] M.D. Roblyer used the term "digital desperation" in the May 2000 issue of *Learning and Leading with Technology*.

[2] *Falling through the Net II: New data on the digital divide*. National Telecommunications and Information Administration, U.S. Commerce Department. Available on the World Wide Web: *http://www.ntia.doc.gov/ntiahome/net2*

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Educational Software

The biggest trend in educational technology is not, as one would expect, in the variety of CD-ROMs that are being published. Sure, all the educational publishers have finally realized that they have to have some software as part of their offerings, or they will be labeled old-fashioned. So, they have added CD-ROMs, usually taking the approach of electronic or e-books (print books with some animation and interactivity added) or the proven technique of electronic workbooks. Some education print publishers have even gone so far as to partner with software companies in providing CD-ROM accompaniments to their textbooks. These are more technologically grounded and really offer new and enriching content in the software while they strengthen the delivery of content that the text brings. Ask your bilingual textbook publisher to see their software. Is it correlated to their textbook? Is it more than just a nod in the technology direction? How much more content and interactivity does in actually add? Definitely check out whether it is just a workbook in electronic form.

Although some educational software companies have been developing their elementary school programs in two languages, many formerly English-only software companies now realize that there is a market "out there" (beyond the US) for Spanish language versions of their products. Unfortunately, many of them have sold or leased the rights to these products to foreign-based companies. As a result, we have seen a plethora of "translated" products that are sold into the bilingual education field at a premium. Why? Because the product is not produced in the US and has to be imported through a reseller — who then has to tack on another charge. Even approaching the software companies directly will not get you access to these products at a lower price, as they have to live by their legal arrangements.

There are some companies that do not function this way and are, therefore, able to offer parallel products in at least two, and sometimes more, languages at a lower cost. These include the following three companies.

- **Gessler/QGroup-USA**, which has a full line of early childhood multiple media programs (CD-ROM, video, audio, books, games) designed around teaching language arts. Their products come in English, Spanish, French, and German and often offer the option of a bilingual "help" button that is perfect for the dual-language classroom.

- **Soleil Software, Inc.** makes a series of CDs that combine English, Spanish and French (Japanese and German are sometimes available by special request). These also have a focus on social studies, science and math content for preK through middle school. This company's products tend to include a "written response" section that requires students to write their thoughts and conclusions as they complete activities.

- **Edmark** (now part of IBM) makes two versions of their early childhood programs (English and Spanish) at the same cost. Beware of the speed at which the Spanish language is produced, though, as they tried to pack in all those words into the same space an English phrase would take. However, the basic software content is excellent.

The rest of the companies have decided to focus on the bigger ESL market, and although you will see some accommodation to other languages in their "help" sections, you will not see truly parallel programs in two languages. Nevertheless, even this help or assistance in the native language is much welcomed, and has become more and more common. The most extensive offerings come from CALI, Inc., but usually at a pretty steep premium per additional language. Ask the representatives of the ESL software you are considering buying whether they have help in other languages, which languages, and how much extra (if anything) it will cost. It is worth exploring.

Voice Recognition

Voice Recognition is another trend but the technology is not quite where it should be to make it completely useful. It is frustrating to speak a perfectly pronounced sentence and get back a "wrong answer" or "no response" from a computer. The companies that make best use of Voice Recognition use it for differentiating one radically different sound or phrase from another. The speech-to-text capabilities of such software as IBM's VoiceType and Dragon Systems could be adapted for multilingual uses, but these software packages require training to be really helpful. Where voice recognition will be a real asset is for those little machines that carry personal information and allow note taking, such as the PIMs (Personal Information Managers) and PDAs (Personal Digital Assistants).

The PIMs came first. These were the Palm Pilot and other similar little but pricey hand held devices. Of course, they now offer calendars, phonebooks, and email access. But these devices are still really for the truly technically adventuresome, or gadget-prone. What was needed was a home-based and *inexpensive* access to the Internet.

So, before we address the biggest trend in educational technology (and its short-sighted view of bilingual education), let us first look at ways that lower-income parents and schools can take advantage of these and other recent developments on the Web.

Inexpensive Devices for Internet Access

There are a variety of little machines that can help Internet "newbies" get online easier and faster, allowing even those with a fear of cyberspace and technology to bypass computers altogether and go straight to the Web. Prices of these devices are reasonable (by computer standards) and access — if you have passed "Go" and already have a telephone — is simple.

WebTV was already being marketed to schools and homes; Microsoft had bought the company and started promoting it several years before. But this device requires a TV set, a somewhat bulky box to use, and a separate keyboard if you want to type anything in. It is only portable if you carry the box and keyboard to another location. To print, you need a newer model or a separate attachment. The price for a basic unit ranges widely, and the variations are limitless. Take a look, for instance, at: *http://www.webtv.com/products/comparison/prod_compare.html*. The basic price of the device does not include the monthly fee or the local telephone calls.

Now there are other, cheaper, smaller and portable solutions, like i-Opener (*http://www.i-opener.com*) and MailStation (*http://www.mailstation.com*), both of which just plug into a regular phone line. i-Opener is bigger and its subscription price parallels WebTV, but it does not require a TV; it includes its own monitor (*http://www.netpliance.com/iopener/specs.asp*). It costs $99 for the gadget, plus the monthly service plus phone call charges. MailStation (*http://www.mailstation.com/details.html*) also costs around $99, but it is much smaller and the service subscription is less than $10 per month or $99 a year. Of course, you cannot see the World Wide Web, but you can use email.

As recently as August 2000, Compaq and Microsoft came out with their own inexpensive device, the iPAQ Home Internet Appliance "with most of the functionality but none of the complexity and aggravation — of a full-fledged PC" (Mossberg, 2000, p. B1). It costs $199, plus $22 a month for Internet access (*http://www.compaq.com*).

The significance of these inexpensive online devices for the bilingual educator, student and parent is the ease of communication and availability of activities that were not previously available. Other technology trends on the Web offer information to share with parents, including

school calendars posted to the school's website, homework assignments, student progress and attendance reports. Those parents who do not have Internet access will again be left out of the loop. As schools use technology as the primary means to communicate with the school community, it has become more than a question of language proficiency. It is a question of technology access.

Wireless Internet and Web

The hottest topic in business-related publications is Wireless services. In the US, we have been practically overrun by wireless telephones, but countries like Sweden and Finland have taken the technology to new uses. For instance, teens in these countries send lots of little keyed-in messages instead of making voice phone calls. They can also pay for beverages and snacks from a dispenser by just giving it their mobile phone number. (Beware of the monthly bills with teenagers using this!)

Wireless for the education community means that computers no longer have to be clamped down to a desk. The portable computer (which still has to be plugged into the wall for electrical boosting of its batteries) can be "plugged into" a network without an actual plug. For instance, the Apple iMac version of a laptop (and the desktop version, for that matter), can run off an Airport hub — a gadget that gives the machines the ability to connect to a network server without cables. Intel, too, has a version like this, while companies like Netschools are building their entire system around laser light impulses sent from a network woven into the ceiling of a room. So it no longer matters what room you are in — you can always get back to the book report you were working on in the library, or the science project you began in the lab, or the homework you started in school.

One of the leading districts in the use of laptops happens to be a bilingual district in New York City, District 6 in the upper West Side of Manhattan. Thanks to the foresight and negotiation skills of the then Superintendent, Anthony Amato, the district partnered with Toshiba and Microsoft to bring laptops to teachers and students. Sure, most of the applications were English-only at the time — but at least a district that was poor, mostly minority, and bilingual got a first crack at an innovative trend.

The other buzz in business circles is the Wireless Web on the phone. However, these devices have to be large enough to provide readable information and that defeats their purpose: to be lightweight and small enough for portability. So, until a better solution comes along — perhaps through the PDAs — only those who are desperate for one or two-line email messages or for airline and stock information on the fly will be making use of the web on their mobile phones. The Palm Pilots of the world, although bulkier, could in the meantime be providing readable Web access, as the companies that make them add Internet capabilities to the little devices.

Hand-Held Digital Devices

Do not disregard the PIMs or Personal Digital Assistants (PDAs) for other leading-edge trends. One of these is handwriting recognition. Remember when Apple tried to sell a hand-held notepad (the Newton) that read handwriting? Well, the technology has gotten much better on these newer devices. The problem is, you almost have to learn how to write all over again, as the machine trains you how to write in its shorthand and not the other way around. Software programs like TealScript and Jot for the Palm Pilot and other PDAs try to make it more natural, but you still have to re-learn how to hand-write as you "train" the software to recognize your penmanship.

What are the implications for bilingual education? These devices sell all over the world so they can handle most languages, even those that are difficult to do with keyboards, like Chinese characters; it is simply a matter of getting the right version. Whether it is a 3Com Palm Pilot, an IBM

Workpad, a Hewlett Packard Jornada, or a Compaq Aero or Handspring Visor, these PDAs or PIMs hold the future of technology in one way or another, and with much potential for bilingual education. Imagine being able to take notes in class in Chinese or Arabic or Korean without a special keyboard.

E-Books

The bridging technology is the e-book. And this is not the software CD-Roms that companies like Broderbund (now Learning Company/ Mattel) first published. These e-books have real text content that can be downloaded from the web. Stephen King recently made a big splash by putting a couple of his new books online for a price. The text gets paid for at a website and then downloaded either to a desktop or to a hand-held e-book.

Priced around $250 to $350, these e-books weigh around one pound, can store up to 5000 pages of words and images (about 10 to 12 novels), and are the size of a paperback. What is next? — The capability of downloading more text, and more text in multiple languages. Actually, even the PDAs will take documents from a text that a teacher may have created and store them for later reading. It requires an extra piece of software, but it is possible. In Japan, an "[e]lectronic book consortium encompassing more than 100 companies, including Microsoft, is reportedly spending $90 million on its vision of E-books"(Manes, 1999).

Some of these nifty handheld e-books include the Rocket eBook, Librius Millennium Ebook, and, for younger readers, the LunchBOOK™ . Actually, for a special price, libraries can buy a SoftBook Reader which is larger than the common hand held device (magazine size), has Ethernet connection for fast book downloads, and comes complete with a "Digital Library" with over 1000 popular e-Book titles. For more details, see: *http://electronic-books.com*.

The Forbes article mentioned above points to "[t]he granddaddy of sources," *Project Gutenberg (http://www.gutenberg.net)*, a loose coalition of volunteers that has been collecting out-of-copyright titles since 1971 and offering them to the public free. The site now lists 1,600 titles, from *As You Like It* to *Tom Swift and His Giant Cannon*. Its links can whisk you to other archives with hundreds of titles by authors from Edwin Abbott (*Flatland*) to Emile Zola (*Nana*, in French or English). Other sites specialize in E-only titles. (Manes, 1999).

A quick search at *http://www.gutenberg.net* yields the full text of *Don Quixote* in Spanish, as well as *La Celestina* and *El Lazarillo de Tormes*, all classics. You can do searches there by language, too. So a Chinese search pulls up Tao Hua Yuan Ji's *Peach Blossom Shangri-la* in both Chinese and English. Of course, a site like this needs volunteers to find classic, out-of-copyright titles, get them converted to digitized text, and put online. But what better people to become such volunteers than bilingual teachers with contacts around the world, who can provide information to this project that will benefit them directly in free online books for their students in their own native languages?

With regard to content, we must also mention that self-publishing has now become a more inexpensive matter, since you can write an e-book, self-publish it for around $200, and distribute it to whomever you like; that is a real solution to the lack of bilingual reading materials. The newer technologies will, with author and publisher permission, or at their instigation, allow for scanning of text in other languages that can then be downloaded to these reading devices. Hard on the eyes? Perhaps. Some studies are already under way and Microsoft has already issued a new iteration on the software to make the text more readable.

Scanners

Scanning devices have been around for a long time, but the software is getting more and more sophisticated, with some programs offering the ability to scan and read text in multiple languages. Some are language specific, like the TransPen, which uses Optical Code Reader (OCR)/scanner, Chinese OCR software, and a English/Chinese two-way translation software to get text on the fly, translate it (as badly as machine translators do), and store it in your computer. There are too many to list, but most of the OCR software offers options in other languages. This is particularly key in getting existing text into digitized form. It still requires human review of errors in the scanning process. For instance, a poorly reproduced (faxed, copied) document may have characters that are not easily read by the scanner and thus require an "editor" to double check that the words are correct in the digitized version.

A newer trend is the pen-sized scanner. One, called the QuickLink Pen, is an electronic highlighter that lets you copy, clip and store printed text, Internet Links, tables and charts and then transfer the data to your computer, PDA or mobile phone. It not only scans text and zaps it to a Palm Pilot, but it also includes a translation dictionary in your choice of language pairs, and gives you the option of using the device itself as a pen to correct or add text to what you have already scanned. And, it does not have to be attached to a computer to store the information it is scanning. It actually runs on standard AAA batteries.

Education Web Portals

Now to the truly newest and biggest trend: education on the web, on demand and, unfortunately, usually only in English. There are a few offerings that have Spanish and some other languages, but they are not coming from the BIG names in this field. The following features characterize online education:

- It starts out being partially or completely free with the ultimate objective of finding funding through advertising or through a subscription that will give you a lot more features.
- It has online tools available to all teachers on the service: grade books, electronic blackboards, education chat rooms, some projects, lesson plan libraries, teacher training online, some educational content, lots of links.
- It is co-sponsored by other companies (usually hardware or infrastructure).
- It allows for home connections and sharing of information with parents.

New offerings in online education include web-building tools and models, education-oriented search engines, reference services such as online encyclopedias, databases of helpful links for teachers and students, online professional development opportunities, and sites designed to encourage communication among participating teachers and students (De Moll, 2000).

These "portals," or online education offerings, function under the premise that if they provide tools that are useful online to teachers who are already online, they will win their undying devotion. The problem is that there are hundreds of these online education sites right now (both for K-12 and for higher education or teacher education), and almost none offer bilingual content. The most they do is provide some ESL solutions and a few links. Why? Because most of them do not know the difference between ESL and bilingual education (or their commonalities). The rest are waiting for teachers who sign up to create their own content — and if that includes bilingual content, then so be it.

Native Language-Specific Education Sites

The best of the news: Here are a couple of education portals that focus on Spanish and, hopefully, portend other portals in other languages in the near future.

- **Elsabio.com**

  http://www.elsabio.com

  This is state-of-the-art K-12 education online content that can be also used offline (subscriptions bring a bimonthly magazine and CD-ROM for teachers). The service is all Spanish right now (with a nod to ESL) but is going into a U.S. trial that will determine whether it goes bilingual. In the meantime, there are lots of interactive tools and activities for teachers and students, especially in math and science. There's a leading edge section for parents, and multinational online educational projects with the International Red Cross and the United Nations, among others. It is a free online subscription for most users, but paid subscriptions bring a lot more online content — especially teacher training on integration of technology — plus the magazine and CDs. The best feature: a Spanish education web search engine. All hits are in Spanish and education-related, and you can search by age group and content area, not just by key word.

- **Secular Electrónica**

  http://escuelaelectronica.com

  Aimed at those adults and students wanting to complete their high-school equivalency diplomas, this site (right now) offers a course in Spanish: *Preparation for The Tests of General Educational Development or GED.* It is limited in scope with tons of text, but it is a great start, much needed, and bilingual. It is also accessible through the Aspira website: *http://www.aspira.org.*

- **Eduhound in Spanish**

  http://www.eduhound.com/espanol

  This is a link to other links. It is very limited right now and mainly focused on resources from Spain, since its main site is in English.

More education portals and a listing of international exchanges are available in the "Additional Resources" section at the end of this document.

Machine Translation

When Franklin Computers came out with a series of hand-held translating dictionaries a few years ago, it was the world traveler who first grabbed them for instant translation of words and phrases. They have since caught on with more serious learners of a language. There are even hand-held devices (see below) that will do in a pinch. For instance, a simple dictionary that is the size of a large pen can offer assistance to students reading English documents or newspapers. Called the Quicktionary, the pen-like device allows users to easily scan a word and view its translation or definition on its own LCD screen. You cannot do much else with it, but it can be a real boost for those English language learners who are beyond reading special ESL-edited books yet who still need some translation assistance.

The real trend — it is really more of a need (and the technology is still very faulty) — is machine translation. Because of shortages of bilingual and bi-literate staff in the U.S., school districts whose minority language populations are just starting to grow find themselves looking for ways to communicate with parents who may or may not be able to read either English or their home language. So they will turn, in desperation, to either software or online "machine translators" that will do a so-so job in translating letters, announcements, and documents.

My recommendation is to go with human translation services (online or direct), or with a machine translation-management system and not with just machine translation. The management system will allow a school district to track whether a document has already been translated into a language and resides on the system's server; it also enables updates to be done to all or some of the translated versions at the same time. However, that solution also requires human intervention in the translation process. So does any other translation solution you might consider, as the machine translators listed here are fair-to-poor.

The most you can get out of these translation engines (software or web) is getting the gist of the document — and this only if the document is business like, straightforward and uses no educational jargon or colloquialism. These engines are more useful as "dictionaries" — especially for phrases that one would not ordinarily find in a dictionary — but rely only on a truly "bi-literate" person's editing/reading of the final version before mailing it to anyone.

Some available translation resources (some free, some for a cost) include:

- **GO Translator**

  http://translator.go.com

  From Go.com (a search engine that used to be called Infoseek), this provides free translation of web pages and text into English, French, German, Portuguese, Italian, and Spanish.

- **Babelfish**

  http://babelfish.altavista.com/translate.dyn

  Altavista's free translation engine is called Babelfish and is used by a variety of other sites.

- **Mezzofanti**

  http://www.mezzofanti.org/translation/index.html

  A pretty nice listing of free online translation engines and dictionaries with free online trials exists at Mezzofanti.

A listing of translation web links is available in the "Additional Resources" section at the end of this document.

Pop-up Translation, Video and Audio

A rather unusual variation on translators, and one that educators who work with less common minority languages might consider seriously when creating new curriculum is something called Richlink. It works with whatever database exists (for example, if you have already created a text with definitions of your native language) and lets you pop them into any other text (in English, say) so that they are available online or offline when you need them. This is not a feasible product to use in print material, but on computer-based documents, it should work fine. The viewer is free, but the databases for automatically adding RichLink pop-up content to documents are sold by the company; they include general language databases and industry-specific terminology databases. Or, you can create your own. Unlike typical online content where users jump from page to page and wait for servers to respond to their requests, RichLink enables multiple layers of information to be efficiently distributed along with documents, and instantaneously viewed within pop-up menus. RichLink pop-up information includes word translations, term definitions, web links, graphics, audio and video. The address is: *http://www.richlink.com/*.

Philanthropy

The other trends in technology that bring some light on the subject of equity is not a technology trend in itself but one brought about because so many entrepreneurs and investors made so much money by developing technology during the past three decades. The Tech and Web millionaires, many of whom did not graduate from college, have turned some of their vast resources to providing access to technology in one way or another. Here then, lies a great opportunity for bilingual education. Start by looking for links to these philanthropies from such sites as:

- **Edutopia: The George Lucas Educational Foundation**

  http://www.glef.org/edutopia/edutopia.html and *http://www.glef.org/foundation/sponsors.html*

  Yes, this is the George Lucas of *Star Wars*. The site's magazine (English and Spanish versions) is free. Links to Sponsors gets you started on funding sources for educational technology.

- **Paul G. Allen Virtual Education Foundation**

  http://www.paulallen.com/foundations/

  Yes, this is Bill Gates' former partner. This foundation seeks to "advance the development and growth of online learning especially distance learning that eliminates dependence upon face-to-face contact as the primary context for learning." It supports research and development of technologies and instructional strategies for computer-mediated instruction and distributed learning environments.

- **SchoolGrants**

  http://www.schoolgrants.org/

  This tries to compile information on grants for all schools, but if you do a search for technology, it will lead you directly to technology-focused foundations and government sources. If you search for both technology and bilingual, you will narrow it down further.

For even more listings, though not specific to bilingual education, read the *Directory of Funding Opportunities* in the June 2000 issue of *Technology & Learning Magazine* (available in archives at: *http://www.techlearning.com*).

Each of the sites above leads you to other sites that can help narrow your searches for technology funding for your schools. The Web has definitely made this information more easily available. Federal as well as private funding for technology for schools (K-12) usually gets targeted by the "techies" in a district; these folks are not often the ones who know the bilingual and ESL needs of the students. So, the least a bilingual educator interested in promoting technology in the schools can do is to educate the local technology coordinator on what is needed for these student populations.

Summary

There is a lot of promise in state of the art and future technologies. Ranging from education Web portals to hand-sized devices, to wireless technologies and e-books, many have yet to be proven successful. Some hold more possibilities for the bilingual educator and bilingual learner - handwriting recognition and e-books, for instance. But ultimately, how aware are bilingual educators of these possibilities? How aggressive are we about not just bridging the technology gap, but sometimes pushing for results beyond the limits? The very children we help to become product developers and innovators in these fields today may be the ones producing the technologies of the future. If we have done a good job, they, too, will be putting a priority on providing access to their newer technologies for speakers of not just English, but of other native languages. After all, already some of the language borders have been crossed by droves of smaller designers, developers and producers whose mission has become to serve the under-served non-English populations of the world.

Additional Resources

Education Portals

Below is a list of some of the bigger portals that are being marketed for a fee or for free. Only one of these is in a language other than English. But knowing which Portals are vying for education funding may help bilingual educators start insisting on bilingual content and resources from them. In that hope, here is the list.

- **AOL@School**

  http://school.aol.com

  AOL@School is a free service from AOL to schools around the country. There is free access if registration is completed through the school. What you will get are mostly links to sites that are searchable otherwise, and almost nothing is bilingual.

- **bigchalk.com**

  http://www.bigchalk.com

  bigchalk.com is supposed to allow teachers to create their own interactive centers of involvement that encourage, inform, and excite students. There are limited lists of links to other resources.

- **ChildU.com**

  http://www.childu.com

  ChildU.com claims to provide a comprehensive individualized curriculum for grades one through eight delivered over the Internet. It offers learning activities and a management reporting system. Potential uses are as an educational supplement in the classroom, learning center or home, and as a tutoring or enrichment tool. Problems include: The content is borrowed from a lot of business partners, so the quality is uneven. It also assumes English literacy, even for activities that are kindergarten level

- **Classroom Connect**

  http://www.classroom.com

  Classroom Connect has been around the longest and is focused on delivering online curriculum materials, student-focused learning expeditions, teacher-focused educational resources and proprietary educational content and learning tools that it sells to districts or schools. It is worth a try (although the cost is an unknown factor that was probably already negotiated at the district level) to get in touch with its bilingual classroom teacher-members through its teacher-search function.

- **Education World**

  http://www.education-world.com

  Education World is a free online resource aimed at simplifying the education community's ability to use the Internet. Actually, this site includes bilingualism as one of the information areas and has links to other sites that can be of use, like a *Political Database of the Americas* (in Spanish, Portuguese, French and English) (*http://www.georgetown.edu/pdba*) and *The Information Superhighway* in Chinese (*http://www.sfusd.edu/programs/chinese/homepage.htm*). Unfortunately, the listing for "bilingualism" is under "foreign languages" and the resources are limited and not their own.

- **Elsabio.com**

  http://www.elsabio.com

  Elsabio.com is the only Spanish-language education portal. Unlike many of the other Education Portals, this site has plenty of content, especially teacher-oriented training using technology in the classroom and advanced levels of science and math for Spanish-dominant students. In many ways, it is far ahead of the U.S. competition and therefore merits ranking here because it could easily team up with one or more of the other Portals to provide bilingual content.

- **Family Education Network (FEN)**

  http://familyeducation.com

  FEN bills itself as providing "information and interactive communication tools to help busy parents" (not bilingual parents, though). It includes quizzes, polls, discussion groups and articles on parenting and education subjects. It is also supposed to include a network of local school Web sites, with school calendars and community-level information enabling parent–school connection, but these links usually are a dead end. The teacher end of the site is a little better, but there is no way to search for bilingual content — not even under "foreign" languages.

- **Lightspan Partnership**

  http://www.lightspan.com

  Lightspan Partnership offers free resources to teachers and students on its homepage, although the company actually sells software and training. A quick search yielded only a few lesson plans, but it did produce 54 websites that were listed as bilingual. A more specific search by language gets you sites *about* the language group, but not necessarily *in* that language (unless you write the search term in the other language and it can be read by the Lightspan search engine). Not a bad start, though.

- **nschool.com**

  http://www.nschool.com.

  nschool.com [sic: the spelling quirks of dot-coms is daunting] is a free Web-based education system supporting communication among parents, students, teachers, and school administrators by including email, calendar and scheduling features, group discussions and Web pages. The catch: ads on teacher and parent pages. Also, there are no accommodations made for input by teachers in languages other than English.

- **NetSchools**

  http://www.netschools.com

  NetSchools is the Web site for a company that sells laptops and wireless networks. However, this Website is designed for school communities, and was supposed to be available in late Spring 2000 either as part of "NetSchools Constellation" (a system integrated laptop/wireless solution) or separately. The latter option is for schools transitioning more gradually toward one-to-one Internet-based learning. This probably means that you can use the Website without a full hardware purchase. Clicking on any button on this site as of late summer 2000 just led to descriptions of what the site hopes to make available soon. It is a neat concept, but there is no content.

- **SchoolNotes.com**

  http://schoolnotes.com/

  SchoolNotes.com is a free community service designed to link educators to their community and complement school Web sites by allowing teachers to post school information online without having to learn HTML programming. Parents and students with Internet access theoretically can reach homework assignments, spelling words, reading lists, and other school material posted to the site. The initial page gives a choice of Spanish or English, but the minute you try to subscribe, everything switches back to English completely.

- **Scholastic Network**

  http://www.scholastic.com or
  http://teacher.scholastic.com/

  Scholastic Network used to charge a pretty hefty charge for this service, and it may still exist, but it is possible to get into some of the activities without a lot of detail by going here. There's a whole Hispanic Heritage section although it is not all necessarily bilingual. However, searches under the teacher or parent section will get you links to possible good sources.

- **Zapme**

  http://www.zapme.com

  Zapme offers a multiple approach to providing access to education. It uses targeted advertising to pay for its online services. Searches for content in other languages is limited (back to the "foreign language" mode). What is unique about this site is the company's ability to bypass wires by offering the Internet through Satellite links. Definitely a trend to watch, as phone lines and cables start reaching their limits of speed and connection, especially for rural schools and older urban schools with wiring problems. They are partnering with a number of companies to provide more content, somewhat like Lightspan or nschools. One result is *http://www.learninggate.com*, which also provides a free grading system, among other services.

International Exchanges

Although international exchanges on the Web have been around the longest, they are still of tremendous direct use for bilingual educators. These are sites or organizations that provide links to other resources and schools that teach the native and second languages. The sites as well as the links are usually free links and they provide a wealth of information, although sometimes it takes a bit of hunting to get to the right age group.

- **EPALS Classroom Exchange**

  http://epals.com

  EPALS Classroom Exchange lists more than 5,900 classrooms from 73 countries. It is a place to meet other international K–12 students, educators, teachers, keypals, or pen pals with whom to start projects.

- **tech.LEARNING**

  http://www.techlearning.com

  tech.LEARNING is a site of ideas, tools, and resources for integrating technology into the K–12 school, classroom and curriculum. The ".com" implies that at least some of its services may eventually require a fee. At this point, though, the resources seem to be freely available.

- **Texas Education Network**

  http://www.tenet.edu

  Texas Education Network is a state-run network that provides in-state resources as well as links to other sites. It is well known in the Southwestern US and its main focus is not necessarily bilingual. Yet because of the Texas population, it has plenty of information in Spanish.

- **The Global SchoolNet Foundation (GSN)**

  http://www.gsn.org/

  GSN sponsors numerous online projects. This 501(c)(3) nonprofit corporation is a major contributor to the philosophy, design, culture and content of Internet-based learning. It aims to link kids, teachers, and parents around the world.

- **The 21st Century Teachers Network**

  http://www.21ct.org/

  The 21st Century Teachers Network is a growing movement of teacher leaders helping themselves and their colleagues to develop new skills for using technology in their teaching and learning environments. Some of these teachers are bilingual, although the network is not.

- **Consortium for School Networking**

  http://www.cosn.org

  Consortium for School Networking promotes the use of telecommunications to improve K–12 learning. Members represent state and local education agencies, nonprofits, companies, and individuals who share their telecommunications-for-education vision.

Translation Web Links

Here are some links that will get you either free use or free trials of translation software, or lead you to services and software companies that do machine translation, sometimes combined with human translation, sometimes not. Be aware of the limitations of machine translation, which include giving wrong phraseology and erroneous grammar, as well as sometimes outrageously funny literal translations of idiomatic expressions.

- **ALS International**

  http://www.alsintl.com/languages/language.htm

  This link offers free translation for a limited period, online. But its forte is its full range of translations into almost any language you can think of. They are not all by machine; many are by human translation.

- **CITAC Translator**

  http://citac-mt.com/

  This is a trainable system with the capability of improving its performance. The CITAC Translator can, according to its own description, translate Chinese text into idiomatic English at a speed of 2000 words per minute with pretty good accuracy. The Translator runs under Windows 95/98 and requires no special Chinese processing systems. It is for office or home use.

- **Pink Software**

  http://www.pinksoftware.com

  This has slow online translation, but offers some African languages, which is rare. Translator Online is a free service to demonstrate Translator. Note that only the most basic engine is used: Use of long sentences or unknown words can easily result in unintelligible output. To get realistic results requires using user-defined dictionaries. These are available on the Translator CD.

- **SystranSoft**

  http://www.systransoft.com/english/products/personal/go_personal.html

  This works in mostly European languages, and comes in versions that will do either text or online (Web, email) translations or both. Plus, for a fee, the company will do human translation.

- **Translation Experts, Ltd.**

  http://www.tranexp.com/

  This is similar to SystranSoft except that it has 30 languages, including Eastern European.

- **TransWiz Software**

  http://www.transwhiz.com/

  This works only on text documents in Word and only from Chinese to English and vice versa. But this is enough to make it unusual and needed. The best feature: it scans the Chinese characters (need a scanner for this).

- **Translate.ru**

  http://www.translate.ru/eng/

  This is best at translations to/from Russian, but offers some other languages. It is online and free.

- **Transparent Language**

  Similar to Systran, this online translator is based on the popular software product Easy Translator 3, also by Transparent Language. It translates to/from German, French, Spanish, Italian, Portuguese, and Norwegian. You have to buy it at your local retailer.

- **Softissimo's Reverso Translation**

  http://www.softissimo.com

  This is a pretty good site and includes Russian as one of the choices. There is no human translation option.

- **BerlitzIt Online Translation Service**

  http://www.berlitzit.com

  BerlitzIt is a person-to-person translation service using professional industry-specific translators. So, be sure to ask for a translator familiar with K-12 education.

- **Para-Plus**

  http://www.para-plus.com/language.htm

  This is not a machine translator at all, but offers a long list of languages they will translate; it includes Haitian or Haitian/Creole and Urdu, among others.

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National Clearinghouse for Bilingual Education (*http://www.ncbe.gwu.edu*)

Technology and Learning (*http://www.techlearning.com*)

The Guttenberg Project (*http://www.gutenberg.net*)

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