



EVERGREEN



Bringing Information Resources to Rural China



BILL & MELINDA GATES FOUNDATION
ACCESS TO LEARNING AWARD RECIPIENT 2004

GEOFFREY Z. LIU

July 2005

Council on Library
and Information Resources

The Bill & Melinda Gates Foundation Access to Learning Award is given annually to a public library or similar organization outside the United States that has shown a commitment to offering the public free access to information technology through an existing innovative program. The award, which includes a grant of up to US \$1 million, is administered by the Council on Library and Information Resources (CLIR). An international advisory committee of librarians and information technology experts reviews the applications and selects the recipient.

**Bill & Melinda Gates Foundation
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2000

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2001

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PROYECTO BIBLIOTECAS GUATEMALA (PROBIGUA),
Guatemala

2002

BIBLORED, Colombia

2003

SMART CAPE ACCESS PROJECT, South Africa

2004

AARHUS PUBLIC LIBRARY, Denmark

CHINA EVERGREEN RURAL LIBRARY SERVICE, China

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The Council on Library and Information Resources (CLIR) is an independent, nonprofit organization that works to expand access to information, however recorded and preserved, as a public good.

In partnership with other organizations, CLIR helps create services that expand the concept of “library” and supports the providers and preservers of information.

Through projects, programs, and publications, CLIR works to maintain and improve access to information for generations to come. For more information, visit www.clir.org.

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The Bill & Melinda Gates Foundation is building upon the unprecedented opportunities of the 21st century to improve equity in global health and learning—because the life and potential of a child born in one place is as valuable as that in another.

The foundation was created in January 2000 through the merger of the Gates Learning Foundation, which worked to expand access to technology through public libraries, and the William H. Gates Foundation, which focused on improving global health. Led by Bill Gates’ father, William H. Gates, Sr., and Patty Stonesifer, the Seattle-based foundation has an endowment of approximately US\$28.8 billion through the personal generosity of Bill and Melinda Gates. For more information, visit www.gatesfoundation.org.

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More information about the China Evergreen Rural Library Service (CERLS) is available at <http://www.cerls.org>.

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Professor Liu's research interests include natural language processing, information retrieval, virtual communities, and the social impact of information technologies. His work has appeared in such publications as the *Journal of American Society for Information Science and Technology* and the *Journal of Computer-Mediated Communication*. Professor Liu has conducted workshops and presented speeches at conferences on digital libraries and information technology at universities across China. He currently serves as a technology adviser for Stanford University's East Asia Library and the Provincial Library of Yunnan in China.

“Accessing information is crucial not only to all levels of education but to the advancement and economic prosperity of any civil society. If we can utilize our school libraries to provide Internet access for the general public, we can significantly improve the quality of life in rural China.”

ZHOU WENJIE
Technology Manager
China Evergreen Rural Library Service



Credit: BILL & MELINDA GATES FOUNDATION/PHOTOGRAPHS: FERNANDO GUTIERREZ

Evergreen representatives receive the Access to Learning Award at the annual meeting of the International Federation of Library Associations and Institutions (IFLA) in Buenos Aires, Argentina. Left to right: IFLA President Kay Raseroka, Evergreen Education Foundation President Faith Chao, Tongwei First High School Principal Niu Tuowen, and Bill & Melinda Gates Foundation Senior Program Officer Carol Erickson.

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P R E F A C E

The Bill & Melinda Gates Foundation Access to Learning Award recognizes innovation in providing universal, free access to information technology. Although the innovations that the award has recognized come in many forms, all recipients have one characteristic in common: They have found a way to use technology, however limited or copious, as a medium to help people help themselves.

The China Evergreen Rural Library Service (CERLS) received the 2004 Access to Learning Award for placing computers in rural public high schools in China as a way of responding to the need for information among students, teachers, and communities in remote areas where poverty and illiteracy are widespread. Today, CERLS has a network of eight public school libraries in the western provinces of Gansu, Shaanxi, and Qinghai, and in the northern province of Jiangsu.

This case study outlines how CERLS is using the public school infrastructure in rural China to introduce computers and information literacy. The study also describes the partnerships that CERLS has formed with local officials, public libraries, and corporations as it seeks to maximize the impact of this work. Through education and training courses, CERLS is giving rural residents the tools they need to improve their own lives and their communities.

This is the third year that CLIR has managed the Access to Learning Award. The experience has given us a unique opportunity to learn what public libraries abroad are doing to address inequities in access to information technology. We are grateful to the Bill & Melinda Gates Foundation for its abiding confidence in our work.

ALICE BISHOP
Special Projects Associate
CLIR

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China, the Nation

With 1.3 billion people, China is the most populous nation on earth. Its land mass is the world's fourth largest but only 15.4 percent is arable. China is one of the most densely populated countries, though inhabitants are unevenly distributed, with more in the east than in the west and more in rural areas than in urban areas.

According to the World Bank, more than 160 million Chinese, many in remote and resource-poor areas in the western and interior regions of the country, live on less than a dollar per day. Most do not have access to clean water, arable land, or adequate health services and education.



This map highlights the areas included in the China Evergreen Rural Library Service network: Qinghai Province, Gansu Province, Shaanxi Province, Jiangsu Province, and the City of Beijing.

INTRODUCTION

Two-thirds of China's 1.3 billion people live in rural areas and have extremely limited access to information resources. Nowhere are those resources scarcer than in western China, which has not benefited from the prosperity of the coastal region and where poverty and illiteracy abound. According to China's Ministry of Education, about 90 percent of China's illiterate population live in rural areas. Half of these people live in the western provinces, and 70 percent are female.

"This organization has taken courageous steps to connect underserved communities in remote areas of China with knowledge and information through computers in libraries."

BILL GATES, SR.
Co-chair, Bill & Melinda Gates Foundation

To help combat illiteracy and poverty, the China Evergreen Rural Library Service (CERLS) provides free access to information resources in China's rural communities through public school libraries. At these sites, students, teachers, and members of the public learn to use computer technology and the Internet to explore tools for literacy, to obtain practical information, and to engage in lifelong learning.

The CERLS Network

Founded in 2001, the CERLS network includes eight public school libraries in the western provinces of Gansu, Qinghai, and Shaanxi and in the eastern province of Jiangsu. Recently, two elementary school libraries in Beijing were added to the network. These schools were established for migrant workers' children who are not allowed to enroll in local public schools because their parents are not registered residents of the city. The CERLS libraries serve a combined student population of nearly 20,000 and a combined community population of well over 1 million.

While China has a vast network of public libraries, many charge for access. Most public libraries, moreover, are located in cities; rural counties typically have only a book station in their local culture center. The few public libraries that do exist in rural areas tend to have outdated collections and no access to information technology. Because of lack of funding, most of these county-level public libraries have not been able to add books to their collections for at least 10 years. Whatever funds these libraries do receive from their county government barely cover salaries, building maintenance, and utilities.

Since its founding, CERLS has purchased computer hardware and software for school libraries; provided training on the use of information technology and the concept of information literacy for librarians, teachers, students, and the public; and helped libraries automate their operations and update their collections to meet community needs. CERLS has expanded its staff from 3 to 11, including several administrators as well as one representative for each province where the program operates.

Local CERLS Partners

Historically, Chinese families have valued education above all else as a means of social mobility. In imperial China, annual civil examinations enabled young people from



Huining Fourth High School is one of three CERLS projects in Gansu Province that provides automated library systems and modern technology with Internet access for students and the public.

even the poorest families and the most remote corners of the empire to compete for coveted official positions. CERLS decided to build on the value placed on education and to use school libraries to place information technology in the hands of those who need it most.

In looking for potential sites, CERLS sought out schools and local officials who were amenable to the idea of open access to information technology. Support for CERLS came from all levels—from county governors to school principals, all of whom saw the potential for economic development and advancement through information technology.

Key to this program's success was defining the obligations of each entity involved in establishing the libraries. CERLS agreed to provide computer equipment and library-management software, technology training, and a substantial number of books to update collections and fill major gaps in collection development. Participating schools, in turn, had

to provide Internet access, librarians, staff, space, and furniture. This was often done with the help of the provincial or local ministries of education.

Site Selection

In September 2001, a team of librarians and educators from the Evergreen Education Foundation in California (CERLS' American fiscal agent) went to China to scout sites in Gansu, Qinghai, and Shaanxi provinces. Evergreen was founded in 2001 by a group of Chinese and American professionals and academics who volunteer their time to raise funds in the United States, primarily from Chinese-Americans, to enhance education in rural China. The Evergreen team was accompanied by Liu Dunzhi, CERLS director and a retired engineer; Zhang Rui, CERLS regional manager and a retired official of the Education Bureau in Gansu Province; and Zhang Hongshan, CERLS regional manager and an official of the Education Bureau in Qinghai Province.

Following consultations with Evergreen, CERLS started a pilot project at one public school. The purpose of the pilot effort was to find the best way to facilitate access to information technology. Qinghai's Datong Sixth High School was selected as the site for the pilot project. The library was given one server, several workstations, a printer, a bar-code scanner, software, and books. Workstations were loaded with standard Chinese Microsoft Office word processing, spreadsheet, and presentation software.

After about six months, additional projects were started at Tongwei First High School and Tianzhu First High School in Gansu as well as at Danfeng High School in Shaanxi. Drawing on its experience at Datong, CERLS developed a standard list of computer equipment with technical specifications of hardware capacities and software installation. The number of books purchased for each school was based on the size of its student population and its library's existing collection.

Province	School	No. of Students	No. of Teachers/Staff
Qinghai	Datong Sixth High School	2,101	136
	Lijiashan High School	1,710	99
	Gonghe Huanhu Minority School	298	38
Gansu	Tianzhu First High School	3,100	174
	Tongwei First High School	3,300	205
	Huining Fourth High School	3,130	141
Shaanxi	Danfeng High School	3,035	234
Jiangsu	Taidong High School	1,600	123
Beijing	Anning Elementary School	390	15
	Hebei Central School	1,200	40

Table 1. Participating CERLS Schools, 2004

These four school libraries were completely automated by 2002. Four more schools—Lijiashan High School and Gonghe Huanhu Minority School in Qinghai, Huining Fourth High School in Gansu, and Taidong High School in Jiangsu—were added to the program in 2003. In 2004, the two schools for migrant workers' children in Beijing—Anning and Hebei—were added to the CERLS network. Details on the schools that currently participate in the program appear in Table 1.

Qinghai Province

Qinghai is the least developed and poorest of China's western provinces. This vast region is home to many ethnic minorities, including Tibetans, Hui, Mongolians, Manchus, Tus, and Salars. CERLS provides library and information resources in both official Mandarin Chinese and their native languages. Today, there are three CERLS school libraries in Qinghai—at Datong Sixth High School, Lijiashan High School, and Gonghe Huanhu Minority School.

DATONG COUNTY

The first CERLS library was established at Datong Sixth High School, which is about 20 miles north of Xining, the capital of Qinghai



Danfeng High School in Shaanxi Province has the largest number of public access computers of all the CERLS sites. One computer lab is devoted solely to teaching computer-related courses and training on the library system.

Province. Datong has approximately 2,101 students and 136 teachers and staff. Although the school completed its library automation in about six months, the process did not proceed as smoothly as expected, mainly because the project team lacked experience and there were personnel changes in the school's administration.

LIJIASHAN, HUANGZHONG COUNTY

Located about 11 miles west of Xining, Lijiashan High School has 1,710 students and 99 teachers and staff. School staff use CERLS laptop computers to reach out to the community: A teacher travels to remote villages and fields to show farmers new agricultural techniques and help raise awareness about environmental issues, with PowerPoint presentations running on a laptop computer from CD-ROMs.

The school has also established community service stations at the county's cultural activity center and at a fine art shop in town as a way to reach local residents and villagers.

The fine art shop was selected because its owner, Wang Ruping, is well known among local residents for his passion for Chinese calligraphy and books. Lijiashan has finished cataloging its collection and is in the process of issuing photo-ID library cards with bar codes for its students.

HUANHU, GONGHE COUNTY

Gonghe Huanhu Minority School, located on the south bank of the Qinghai Salt Lake, has 298 students and 38 teachers and staff. With CERLS donations, the school is creating a mobile library, including materials in Tibetan and Chinese, to bring information to herdsmen at their sites.

Students at all three schools in Qinghai have been checking out books for their family members. While some of these books address practical topics, e.g., vocational skills and techniques of agricultural and livestock farming, most are literature and entertainment.

Gansu Province

With a population of 23.5 million and an area of 530,000 square kilometers, Gansu stretches from the Mongolian border in the north to the Sichuan Basin in the south. It curves along the edge of the Qinghai-Tibetan plateau and is traversed by mountains and deserts and the upper-stream section of the Yellow River. According to the World Bank, four million of Gansu's residents live below the poverty line. Small villages of farmers reside in valleys between barren yellow mountains or along river banks, growing drought-resistant crops such as wheat, soybeans, rapeseed, and corn, while leaving grasslands intact for Tibetan herdsmen and other minority people to feed their buffalo, sheep, and goats. This is an area where the desert is claiming more and more of the arable land each year.

There are fewer than ten libraries in Gansu province with automated library systems and modern technology with Internet access for the public, according to

Lei Yunyu, vice governor of Tianzhu county, who is in charge of cultural and educational developments. Three are CERLS' libraries.

TIANZHU COUNTY

Tianzhu, Gansu, is at the edge of high grasslands, an area where Tibetan and other minority cultures merge with the mainstream Han culture. It is a designated Tibetan minority autonomous county. Tianzhu residents still talk of the courageous decision of the county governor who moved the entire town in 1986 to its present location where water is more available. It is here that CERLS developed its second automated library at the Tianzhu First High School in 2002.

The county tapped into central government funds earmarked for projects in minority regions to get 60 computers for the library reading room. These supplemented the server and workstations that CERLS donated to the library. In 2004, the school purchased an

additional 60 computers with bank loans and completed wiring the network. With a student population of more than 3,000 and 120 computers, there is about one computer for every 25 students.

In addition, some teachers in Tianzhu bought laptop computers for their own use on and off campus. These laptops were purchased jointly by the teachers and the school, with each teacher paying ¥4000 (about US \$484) and the remaining expenses (about ¥3000 or roughly US \$363) covered by the school with loans from a local bank. Teachers own the computers and can take them if they leave.

TONGWEI COUNTY

Located in the eastern part of the Dingxi District of Gansu, Tongwei is a region of unforgiving mountains that have been turned into terraced fields along the slopes. Water is so scarce that every family buries a water tank



Public use of the information resources at Danfeng High School has increased dramatically. In three years, the number of active library users among students quadrupled while the number among community residents went from zero to 475.

in their front yard to collect rainwater.

Tongwei is one of the poorest counties in China, with annual incomes averaging U.S. \$360. Unemployment is rampant. Many small state-owned enterprises in the area went bankrupt when they were unable to compete with better-managed, larger corporations in the more prosperous provinces. Many families look to education as their best hope: They want their children to be accepted by a university so that they can find jobs.

Before the CERLS project, many residents of Tongwei knew that computers and technology were important, but only from an abstract perspective. Now, with free access to information technology, they have newfound hope that their communities can thrive and move into the twenty-first century.

“While serving students and teachers in daily operations, we are taking steps to implement programs open to the public, free of charge, to maximize the social effects of investments in information technologies and resources,” says Niu Tuowen, principal of Tongwei First High School. He explained that group library cards were issued to neighboring schools in the local area so that teachers from these schools could obtain resources that their own libraries do not have. Tongwei also issued library cards to students’ parents and started a parents’ schooling program to help them obtain basic skills in accessing information resources.

Zhong Hexin, 30, is one of three librarians at the school. CERLS has trained Zhong in how to classify books, catalog them on the computer, and use the computer to search for books in the library collection and for information on the Internet. “Learning the computer helps me keep people better informed,” he says. “I help teachers design better lesson plans and help people in the community solve practical problems.”

Because China now requires testing high school graduates’ computer skills, high schools have been trying all kinds of ways to equip their computer labs. Prior to CERLS’ involvement in the area, Tongwei was able to

convince the local government to purchase 60 computers for its lab. Then, after CERLS donated 30 computers, the local government decided to match that contribution. As a result, Tongwei now has 120 computers in total, not including the library’s servers and workstations.

Ling Shurong, a geography teacher at Tongwei Second High School, uses information resources in the Tongwei First High School Library to prepare her lessons. “The school where I am teaching doesn’t have a library, and I really had nowhere to go when I needed to look up things when preparing a lesson plan,” said Ling. When asked about whether she had shared information with colleagues, she replied, “Oh yes, mostly with a neighbor who is a kindergarten teacher.”

Wei Yuanliang, a 14-year-old student from Lingshan village, which is about 10 kilometers



One key to CERLS’ success is library training. Staff from each school library have been trained in book classification, cataloging, using the computer to search for books in the library collection, and searching the Internet.

from Tongwei First High School, has been using the library to help his father learn more medical skills. Wei Qan, his father, used to be a “barefoot doctor”—a village doctor who provided basic health care, birth assistance, and emergency first aid. When the local commune dissolved, he was sent back to his home village and became a farmer again. Many rural residents are far from a hospital and cannot afford medical fees. To help his neighbors, Wei has started practicing medicine again. Thanks to the library, he is studying both Chinese and Western diagnostic techniques and treatments for common diseases.

“The CERLS project has made a noticeable mark on people’s lives both in terms of cultural development and economic advancement,” said Tongwei County Governor Wang Ya’e.

Partnership with Public Library

In addition to offering campus-based activities and sharing resources with other schools, Tongwei is the first CERLS library to partner with a county public library. In December 2004, a new, four-story building was completed a few blocks away from the campus of Tongwei First High School. The building houses the county’s cultural center, and the third floor contains the county’s public library. This library theoretically serves a population of about 460,000, but with a total annual circulation of only 1,500 books, it is clear that few people use the library.

Established in 1979, the public library has a collection of about 80,000 volumes, including a large number of Chinese rare books as well as general reading materials, newspapers, and magazines. “The library hasn’t added any new books to its collection recently, and everything we have is at least 10 years old, terribly outdated, and not of much use, except for the rare books of course,” said Library Director Zhang Hongwu, pointing to a pile of boxes on the floor.

The library, which employs a staff of 15 librarians and technicians, has been run manually with card catalogs. “The local government

put together the money to build this new home for us, but we do not have any budget to buy computers or new books,” admitted Zhang. So, the library and Tongwei First High School signed a partnership agreement.

Under that agreement, the county public library will receive computer equipment, training for its staff on library automation and the Internet, and share the school library’s collection. In return, the high school, which desperately needed more space for community outreach, will expand its network for the public.

One area of the third floor in the new building has been earmarked for shelving and circulating books from the school library. Two computer workstations, with a printer and two bar-code scanners, will be networked with the server at the high school for accessing the school library’s online catalog. CERLS has bought a copy of Hua Xia software for the public library to automate its operation. The school librarians are providing technology training for the county public library staff on the use of Hua Xia library automation software as well as on automated library operations and online cataloging in China’s own MARC format. As part of the agreement with CERLS, the county governor of Tongwei pledged to provide Internet access for the public library.

With this partnership serving as an example, managers at the other CERLS libraries are considering adopting similar strategies. “We have explored the possibility of teaming up with the county culture center’s book station since Tianzhu does not have a formal public library,” said Jiang Guodong, principal of Tianzhu First High School. The book station serves a community of approximately 200,000 residents. With the support of the local government, Tianzhu First High School has already established a satellite site at the cultural center, and CERLS is sending both computer hardware and software to support this site. The local government will provide the Internet connection and cover the librarian’s salary.



Like many of his fellow students, Li Hongbin lives at Huining Fourth High School during the week and makes the 40-mile trek across mountains to his home on the weekends.

Satellite Information Stations

Tongwei has established satellite information stations at agricultural technology centers and specialty farms. One of Tongwei's satellite information stations is in the county's Agricultural Technology Experimental Zone, located on the outskirts of town. The county government established the experimental zone in 2000 to develop farming technologies for edible vegetables and crops. Growing mushrooms is one of their specialties.

"Golden needle mushrooms normally grow only in the cold season," said Yang Xueyun, associate manager of the experimental zone, "but we wanted to produce them in the summer for year-round income." He started by reading technical information from the library and from online sources using the networked computers. After two years, he and his colleagues succeeded not only in growing

the mushrooms in the summer but also in making the process practical and feasible for general adoption. In Tongwei, there are now more than 50 specialty farms producing various kinds of edible and medicinal mushrooms.

HUINING COUNTY

In the southeastern part of Gansu, to the north of Tongwei, sits the county of Huining, which has 917 villages and a total population of more than 470,000. Located in the county's capital, Huining Fourth High School has a student population of 3,130 and 141 teachers and staff. CERLS donated three computers and Hua Xia software to automate its library and US \$1,200 worth of books to update and expand its collection. The school library completed its automation and went into full operation serving students, teachers, and local residents in March 2004.

Like many students, 13-year-old Li Hongbin lives at the school during the week because his home is 40 miles across mountains from the high school. “When I go to the library I learn about things that I never knew about, and I’m motivated to do better,” says Li. He hopes to be a math teacher one day.

Shaanxi Province

The City of Xi’an is China’s ancient capital. Known for its terra-cotta warriors and city wall, Xi’an is a major tourist destination in Shaanxi, which has a population of 34.4 million. Three hours by road east of Xi’an sits Danfeng. This rural town is surrounded by lush, green mountains where corn, wheat, vegetables, and flowers dot the landscape.

DANFENG COUNTY

Of the CERLS sites, Danfeng High School has the largest number of public access computers. School officials leveraged CERLS’ donation by getting the county’s Education Bureau to provide 60 networked computers and to establish an electronic reading room. In addition, the local government made Danfeng High School a regional focal point for information technology by providing additional computers to ensure that the school had one computer for every 10 students.

Now, Danfeng has more than 200 computers divided into three groups. One group, which is open to the public, is in the electronic reading room, which is networked to the library system and has Internet access. The second group is located in the computer lab, which is the site for teaching computer-related courses and training on the library system, and teaching skills in Internet searching and information literacy. The third group of computers is distributed among classrooms for daily instructional use.

Wang Yan, 13, is an eager student who loves to study English. Her mother is a brick

layer. When her father died, her 15-year-old brother had to quit school to help support the family. “I feel very lucky to have the opportunity to go to school and study,” she says. “I like to get on the computer and read about the United States. It is so far away, but the computer makes it seem very close,” she says. Wang’s home is a 30-minute walk from school.

With a collection of 60,960 volumes and 2,500 e-books, Danfeng’s library is about twice the size of Tongwei, the second-largest library in the CERLS network. Thanks to automation and improved computer access, public use of these resources has improved exponentially. Between 2001 and 2004, the number of active library users among students increased from 685 to 3,140 in 2004, use by teachers and staff grew from 125 to 235, and use by community residents went from zero to 475. Book circulation jumped from 3,188 to 14,370 in that same three-year period. Average monthly circulation is currently 1,198 volumes. The electronic reading room has



Thirteen-year-old Wang Yen appreciates the opportunity to learn about other countries through the library at Danfeng High School. After her father died, her brother had to quit school to help support the family. Her mother is a brick layer.

also been popular; about 240 students, teachers, and local community members visit each day, mostly reading e-books and accessing the Internet.

Outreach to Farmers

Liu Jianhua was an unemployed factory worker until he visited the school library, got on the Internet, and found information about sheep farming, a profession he had always wanted to try. “The computer changed my life in a way that I never could have seen. Now, I share my experience with my neighbors and tell them to go use the computer because it is so powerful,” Liu says. He has built a thriving business and hopes to give some of his profits back to his alma mater to help expand the computer lab.

Like Tongwei, Danfeng has established satellite information stations at agricultural technology centers and specialty farms. Both schools have chosen locations that are easily accessible for local farmers and then identified sources of information that will help them improve their farming practices.



Liu Jianhua, 45, used the computers at Danfeng to learn about sheep farming and started his own business which has become quite successful.

Jiangsu Province

Jiangsu Province is located on China’s coast, just south of the Qingdao Peninsula. The Yangtze River runs through the southern tip of the province, separating the area from the rest of China’s east coast, which has seen significant economic development. Dongtai—which translates as “eastern plateau”—is located in the central east part of Jiangsu. It encompasses 23 rural towns and has a population of more than 1.2 million.

TAIDONG, DONGTAI CITY

Taidong High School in Dongtai, with 1,600 students and 123 teachers and staff, was added to the CERLS network early in 2004. With CERLS’ donation of US \$10,000 worth of computer equipment and books, the school library has already completed its automation and is now in full operation, serving both the campus and local communities.

City of Beijing

As China’s economic and industrial development has focused on major cities, particularly those along the east coast, opportunities for rural residents in central and western China have diminished. With a surplus of farmers and shrinking arable land, thousands of farmers have abandoned their fields to become migrant workers in urban areas.

China’s capital, Beijing, has seen a huge influx of migrant workers. While the workers try to make a living at construction and other miscellaneous jobs, their children’s education is at risk because they are not legal residents of the city and therefore are not allowed to enroll in the public schools. According to census data released by the local government, the total population of school-age migrant workers’ children in Beijing grew from 98,000 in 2000 to 288,400 in 2004.

Local charity organizations and migrant workers have established schools to provide education for these children. The schools exist without the government’s approval and are consequently not recognized by the

public education system. In 2002, there were 123 schools for migrant workers' children in Beijing. Today, Beijing has at least 299 such schools.

In 2004, CERLS started supporting libraries in two migrant workers' schools in Beijing. Anning Zhuang Elementary School, which was started by Shang Jianfeng in 2001, is in the Haidian District just outside the northwestern corner of Beijing's No. 5 Freeway. Fifteen teachers instruct some 390 migrant children. CERLS started helping the school establish a library by donating about US \$1,000 worth of books.

Hebei Central School, which was started by Cao Jinzhong in 1996, is located in the Chaoyang District of the lower northeast corner of Beijing, inside the No. 5 Freeway. About 20 percent of the residents in this area are vegetable farmers from Zhangbei County. The rest are migrant workers from different provinces. The school has more than 1,200 students, including 160 in junior high, taught by about 40 teachers. The school library had about 3,000 outdated books. CERLS donated a computer, printer, bar-code scanner, and library-management software, along with approximately 1,500 books. Teachers are learning how to catalog the books using Hua Xia software. CERLS hopes these two libraries will become resource bases for migrant workers to acquire information, knowledge, and vocational skills.

Technology Training

Technology training has been vital to CERLS' success. In April 2002, two trainers from Hua Xia Information Technologies Inc., the company that supplied the software selected by CERLS, went to Datong, Qinghai, to conduct an on-site workshop on library automation software and book classification and cataloging. Two aspiring librarians from each of seven schools (Datong, Lijiashan, and Gonghe in Qinghai; Tongwei, Tianzhu, and Huining in Gansu; and Danfeng in Shaanxi) attended the training. The trainees were

either staff who had been responsible for managing the school's library or teachers that the school administration had reassigned to be full-time librarians.

"That was hard work," said Wu Qiuru, the teacher-turned-librarian from Danfeng High School. "The technical subjects were challenging and the learning curve was steep, but it was fun and exciting as well. We used to think that running a school library is just like running a bookstore, but now we know better."

"Running a bookstore" is what most school libraries in China have been doing, handling books that are neither cataloged nor labeled, and keeping manual inventories of circulating and returned materials. Workshop trainees were taught not only the technical skills of system operation, classification, and online cataloging according to China's own MARC standard but also the concepts of reference services, outreach programs, collection development, and curricular support of classroom teaching.

The librarians at Datong, Lijiashan, Danfeng, Huining, Dongtai, Tianzhu, and Tongwei have now cataloged all the books in their collections and have entered bibliographic records into the database using the Hua Xia software.

CERLS Technology Manager Zhou Wenjie worked with local school officials and Hua Xia to select the computer equipment. At each host library, a server, at least two workstations, a printer, two bar-code scanners, and a digital camera were purchased, along with about 5,000 books. The digital camera



Yang Xueyun heads up Tongwei's Agricultural Technology Experimental Zone, which helps unemployed workers learn new agricultural skills, such as mushroom farming.

was used for making library ID cards. Within six months of the arrival of the equipment, school libraries at Datong, Lijiashan, Danfeng, Huining, Dongtai, Tianzhu, and Tongwei were fully operational.

At each school, the Evergreen Education Foundation provided 15 to 30 students with work scholarships. The librarians trained these students on how to use the technology and how to help other students, and then assigned them to work for two hours every week at the library. The scholarships served a dual purpose. Outstanding students whose parents had limited means could complete their high school education while helping other students and teachers learn to use the library's automated system and computer equipment.

Information Literacy

The concept of information literacy is still new to both teachers and students in China. In the context of CERLS, *information literacy* means that students and teachers know how to make use of the library system, including computers and the Internet, to search for information needed for learning and teaching. Teachers can then encourage inquiry-based learning— independent exploration and inquiry with use of information resources—to foster critical and original thinking. Students can search, gather, analyze, and synthesize information to answer questions, satisfy their curiosity, draw conclusions, and work out solutions to practical problems.

This approach stands in stark contrast to the rote learning that has traditionally been emphasized in China. Inquiry-based teaching and learning—especially in K–12 education—is often dismissed by China's education professionals. Although China's Ministry of Education has been calling for educational reform, striking a balance between objective and quantitative methods of outcome measurements and more creative and innovative methods of education is difficult. To promote innovative teaching and to introduce Chinese educators to alternative instructional theories



Danfeng High School is the only CERLS site in Shaanxi Province. It has more than 3,000 students.

and techniques, CERLS organized a number of programs to stimulate and promote inquiry-based teaching and learning. These have included public-access workshops, seminars, competitions, exhibits, and an international conference on the use of information technology in education.

In summer 2002, a group of American librarians, college professors, and secondary school teachers offered a series of information-literacy workshops through the CERLS network. Their first stop was Xining, Qinghai, followed by smaller workshops in Suqian, Yanchen, and Yangzhou in Jiangsu Province.

At each workshop, Chinese teachers learned about information literacy and how to use the Internet to access information and conduct research. They also explored innovative approaches to teaching by working in groups to develop Web- and PowerPoint-based lesson plans that applied principles of inquiry-based teaching and learning. For example, one group of teachers developed a lesson plan to teach geography by having students conduct research and trace the route of the ancient Silk Road. Lesson plans developed during the

workshops were subsequently uploaded on to CERLS' Web site afterward to be shared by teachers at other schools.

School librarians have also been conducting workshops to train their own teachers, students, and people from their communities in information technology. In Tongwei, for example, the librarian trained about 150 villagers with relatively good education—mostly high school graduates—to become “information agents.” These villagers were trained on how to use the library automation system, the library's user policy, and the social significance of promoting information use among other villagers. There is an increase in book circulation as a result, and the school librarian hopes that these agents will encourage more villagers to use the library over the long term.

In spring 2003, CERLS sponsored an award competition among all its schools. Students had to conduct library research and submit a project on local geography and history. Award-winning projects, selected by a panel of experts in the San Francisco Bay area, were displayed at the headquarters of the Chinese newspaper *World Journal* in San Francisco and at the China Institute in New York City. The competition motivated students and teachers to learn how to conduct library research and use information resources for learning.

CERLS Corporate Partnerships

With help from the Evergreen Education Foundation, CERLS has leveraged its impact by securing corporate donors. For example, SuperStar, a Beijing-based Chinese technology company involved in digitizing library collections, donated 1,000 reading cards. These cards allow computers with Internet connection to access SuperStar's database of more than 1 million books and 10 million articles stored in its digital collection. Each CERLS library has SuperStar reading cards, which offer access to information that the libraries otherwise would not have.

Semia is a Danish robot company with a branch in China. It donated five sets of LEGO robots—programmable electronic parts that can be assembled into robots of different functionalities. Five schools have used these robots to set up extracurricular-activity labs where students can explore and practice computer-programming skills. CERLS is ordering additional sets for the other schools in its network.

Another company based in China, V2Technology, donated its teleconferencing software to CERLS so that project schools can conduct virtual meetings to share ideas and exchange information.

CERLS project school libraries bought Hua Xia 2000 software from its manufacturer, Hua Xia Information Technologies Inc., with discounts for group licensing. The software was selected because of its rich functions of searching and user data gathering and support of bibliographic records sharing. The company donated services for hardware and software installation, user training, and retrospective cataloging in Datong, Qinghai.



CERLS has organized several information literacy programs to stimulate and promote inquiry-based teaching and learning.

Expanding the CERLS Network

With the Bill & Melinda Gates Foundation Access to Learning Award, CERLS will expand its network in the following ways: (1) installing computers with Internet access at existing satellite information stations; (2) establishing a technological infrastructure for resource sharing among project schools; (3) adding schools to the network; and (4) providing additional workshops and training to school librarians and community users in the CERLS network to improve their information technology skills.

CERLS will also start a new library project in Yunnan, a province in southwestern China close to the Burmese border. The region is dominated by minority groups who live mostly in poverty. A specific school has not yet been determined.

“The partnership between Evergreen Education Foundation and CERLS has been extraordinary,” said Faith Chao, president of Evergreen Education Foundation, “because it emerged from a common vision on both sides of the Pacific Ocean to provide information resources to remote areas of China.” With the U.S. organization raising funds and providing consultation services, CERLS

determines individual project direction, identifies the location of satellite information centers, and supervises the implementation at each local site. Representatives from both CERLS and the foundation meet annually to discuss future plans and ways to improve operations.

“There is no doubt that receiving the award has energized everyone and will be enormously important for future expansion of the CERLS network in China,” added Chao.

Conclusion

The significance of CERLS can best be measured in the countless students, teachers, and rural residents who have been able to access information that they otherwise would not have to improve their lives.

Thirty-five-year-old Wang Yinfang of Danfeng never thought her children would be able to find such opportunities within their own town. “I’ve lived here all my life and could not see any hope for my children. But now I see for myself from the computer that the more we learn the more developed we can become. My children are definitely going to lead a better life,” she said with a smile.

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