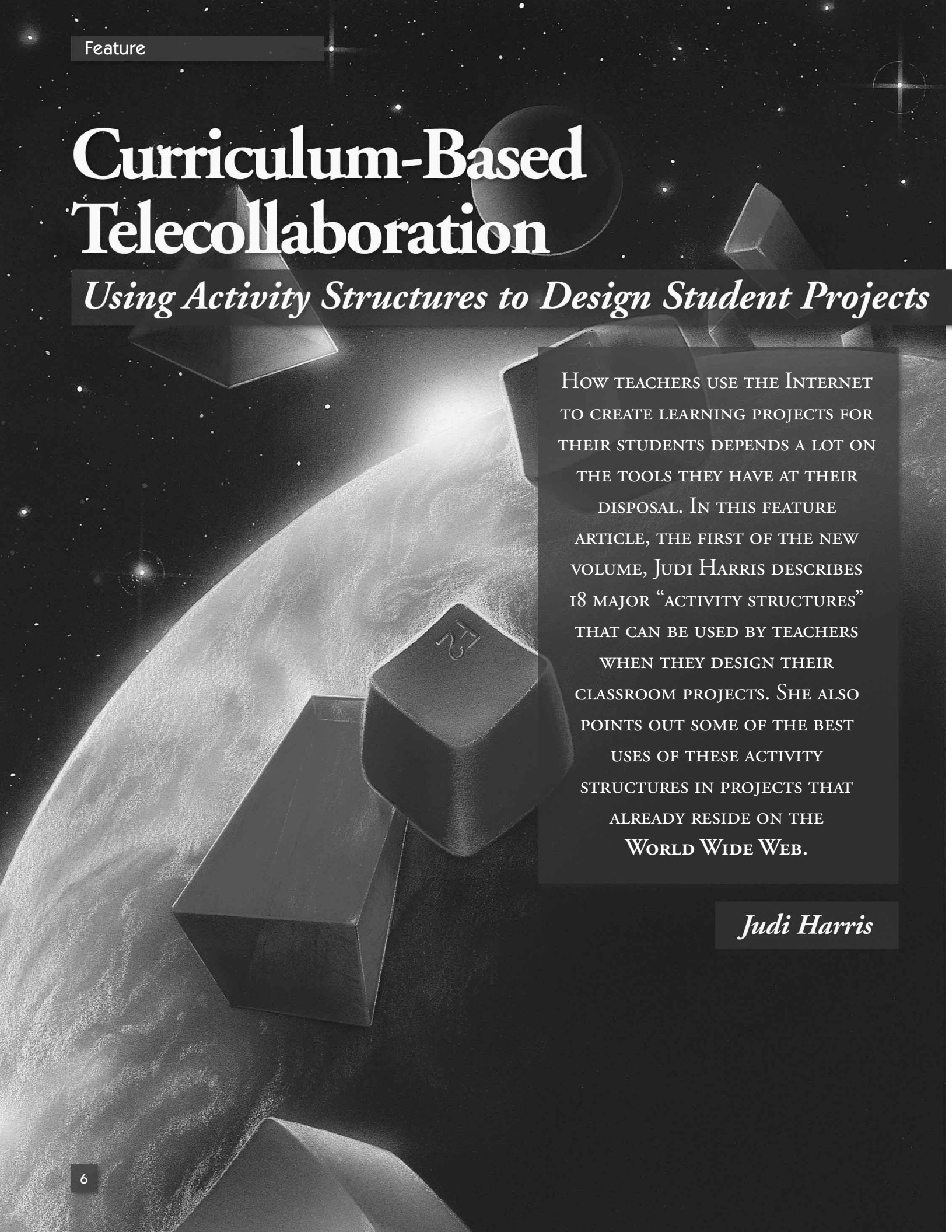
Curriculum-Based Telecollaboration

Using Activity Structures to Design Student Projects

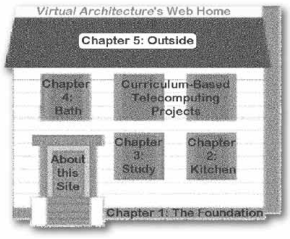


How teachers use the Internet to create learning projects for their students depends a lot on the tools they have at their disposal. In this feature article, the first of the new volume, Judi Harris describes 18 major "activity structures" that can be used by teachers when they design their classroom projects. She also points out some of the best uses of these activity structures in projects that already reside on the World Wide Web.

Judi Harris

Activity structures are design tools. Teachers can use them to help their students "telecollaboratively" use the Internet to accomplish curriculum-related learning goals. The nature and reasons for using activity structures were introduced in an earlier "Mining the Internet" column ("Wetware: Why Use Activity Structures?" December/January 1997–98). Here I discuss all 18 activity structures, which have been updated since their last appearance in *The Computing Teacher* in March, April, and May 1995. More information about each structure is available in my book *Virtual Architecture: Designing and Directing Curriculum-Based Telecomputing* (ISTE, 1998).

How were these design tools created? While analyzing the structures of thousands of educational telecomputing activities that were shared by teacher-designers via the Internet, I was able to identify three major categories of student action, each with five to seven activity types. I labeled these categories according to the dominant type of learning act that each activity class used: (1) interpersonal exchange, (2) information collection and analysis, and (3) problem solving. In this article, I provide an overview of these categories and structures. See **Virtual Architecture's Web Home** for more examples.



Interpersonal Exchange

Interpersonal exchange is the oldest and among the most popular types of educational telecomputing activities, one in which individuals or groups "talk" electronically with one another by using electronic mail (e-mail), asynchronous large-group discussion tools (such as Web conferences, bulletin boards, and newsgroups), or real-time text or audio- and video-conferencing tools (such as Internet Relay Chat [IRC] or **CU-SeeMe**). Six activity structures are now associated with interpersonal exchange processes: keypals, global classrooms, electronic appearances, telementoring, question-and-answer activities, and impersonations.

Image courtesy of White Pine Software

Structure 1: Keypals. Keypal projects were the first commonly used telecomputing activity structures; they are similar to more traditional penpal activities. Students typically work in pairs and communicate with each other electronically, often suggesting their own discussion topics.

Image courtesy of the Hobart-Malang Electronic Mail Project

For example, fourth-year students and teachers at the Hobart School in Tasmania produced a beautiful Web site, the **Hobart-Malang Electronic Mail Project,** to chronicle their rich year-long exchanges with peers attending the Malang School in Indonesia. By electronically sharing messages, photographs, and artwork, these students helped each other understand their respective cultures, customs, and everyday lives as they discussed such topics as native animals, traditional folktales, homes, religions, school curricula, and what it "feels like" to be Australian or Indonesian.

Keypal-like interactions also can occur with real-time text-chat tools such as IRC. For example, students at the Leo Ussak Elementary School in Rankin Inlet in the Canadian Arctic communicated with children in Hawaii and two adults who had just completed a dogsled trip from Manitoba to the Northwest Territories. (You can learn more about using IRC at **IRC Users Central**.)

Unfortunately, student-to-student keypal exchanges often take more time to manage than teachers typically have. Sending and receiving many e-mail messages through a single class account (or monitoring many messages if students have their own accounts) can make keypal activity structures difficult to justify for the time and effort required.

Structure 2: Global Classrooms. Group-to-group exchanges—or *global classrooms*—especially those that emphasize a particular curriculum area, can be fascinating yet manageable collaborative explorations. With this activity structure, two or more classrooms in different locations can study a common topic together during an agreed-upon time period. Global classroom structures are much more common than keypal structures, probably because they are logistically easier. Their activities also seem better for focusing on specific content, which may be why teachers often see them as better fits for the curriculum.

The simplest type of activity that uses this structure creates a virtual learning space, usually as one class extends its own discussion of a topic to other classes studying the same topic. The Instructional Technology Develop-

ment Consortium in San Bernardino County, California, for example, coordinates literature study through its **Read to Write Project,** which sponsors activities according to literary genres, such as historical fiction or biography.

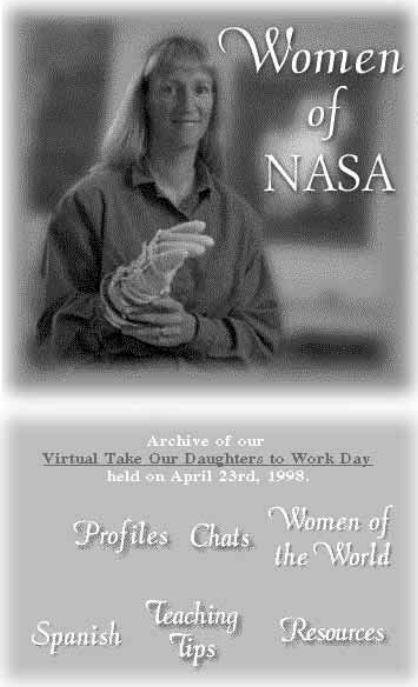
Some global classroom projects are structurally simple and short-lived, while others are quite complex and can involve students from many countries for one or more semesters. These projects are often conceptualized as both interdisciplinary investigations and thematically organized inquiries. For example, Hannah Sivan and David Lloyd (both in Sde Boker, Israel) coordinated several such projects, including **Desert and Desertification** and **Earth's Crust and Plate Tectonics.**

I have been using both *activity* and *project* to describe what can be designed with activity structures. Although both words are probably used interchangeably by educators, we'll use *activity* here to denote something of shorter duration and *project* for something longer. Usually, though, activities combine to form a single project. The activity structures described so far might best be considered projects. The next structure would probably help us build an activity.

Structure 3: Electronic Appearances. Interpersonal exchanges can also host special guests who can communicate with students either in real time or asynchronously. The typical *electronic appearance* is a one-time visit from a subject-matter expert, or SME; some guests or experts might even be famous.

Although electronic appearances are certainly possible with e-mail and asynchronous computer-conferencing tools, most are done with real-time text-chat or videoconferencing programs such as **CU-SeeMe.** This gives the session's participants a "telepresence" (Riel & Harassim, 1994) and accommodates the short-term nature of this kind of activity.

The **Women of NASA** project has one of the best-developed electronic



Images courtesy of the Quest Project, NASA's K–12 Internet Initiative

appearances on the World Wide Web. The site acquaints visitors with the specializations, histories, and daily lives of more than 50 female NASA scientists, mathematicians, engineers, and administrators. For each woman, an autobiography and "day in the life" documents are available. Monitored Web chats with individual participating scientists are scheduled each month; during these sessions participants discuss "math, science, space, technology, and gender equity," according to their interests and preferences.

Such Internet-assisted connections of SMEs with students for synchronous or asynchronous inquiry-based dialogue is an exciting but underused aspect of global telecommunications. Electronic appearance activities usually allow only relatively short periods of communication between students and other people.

Structure 4: Telementoring. When exchanges with SMEs become more extended, and a "teleapprenticeship" (Levin, Riel, Miyake, & Cohen, 1987) forms, the activity structure can be described as *telementoring*. With this structure, Internet-connected specialists from universities, businesses, governments, or other schools can serve as electronic mentors to students who want to explore specific study topics in an interactive format. For example, **Hewlett Packard's E-Mail Mentor Program** helps individual U.S. students in Grades 5 through 12 who are interested in math or science find mentors in the company's international centers.

The **Electronic Emissary** (under my direction) is a service that matches volunteer SMEs from around the world with teachers and their classes. A database of information on the Emissary's volunteer experts can be searched by teachers and students according to curriculum topics. The service helps a new team of SME, teacher, and students structure a mentoring project that focuses on students' curriculum-related inquiry in the SME's field of expertise. Students and teachers then communicate with the SMEs, often using e-mail. All communications are monitored and facilitated by Emissary staff members, who are experienced educators and online project facilitators. After the project has ended, team members share what they learned with other visitors to the Emissary site; they create searchable documents for other Internet-connected students and teachers to use in their own project planning. A sample exchange, **Lanier Middle School's Electronic Emissary Project,** is available online; it addresses journalism and in-

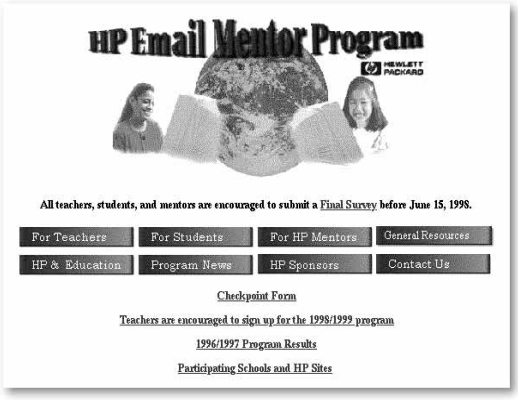
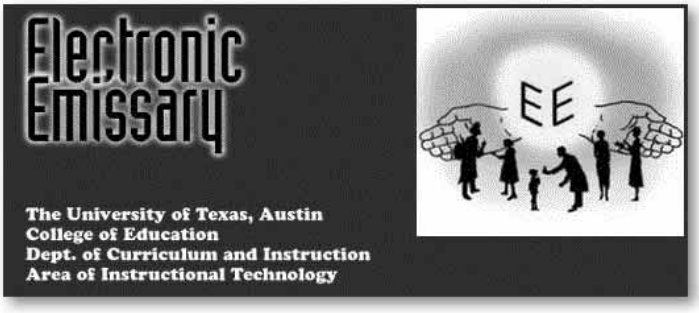


Image courtesy of Hewlett-Packard's E-Mail Mentor Program



volves students from Lanier Middle School in Houston, Texas, and James Derk, the computer columnist for *The Evansville* (Indiana) *Courier*.

Structure 5: Question-and-Answer Activities. Another activity structure has recently emerged in which students' contacts with SMEs are the briefest possible. As the amount and varieties of online information continue to grow exponentially, so can the difficulties in finding answers to questions that meet our needs as learners. For students who either cannot find the information they need to answer a question or do not fully understand the information they have found online, a *question-and-answer* activity might be appropriate.

By far the most common question-and-answer activities on the Web are "ask-the-expert" services. Pitsco, Inc., for example, has organized more than 300 services into its **Ask an Expert** index; the company has made it much easier for learners to find answers to their questions. Ask an Expert divides its growing index of services into 12 subgroups (e.g., science and technology, health, arts, and law), and a search engine helps visitors locate the best expert service to answer a particular question, whether it's "Ask a Volcanologist" or "Ask a Veterinarian."

Structure 6: Impersonations. In every activity structure we've examined so far, participants have shared information that directly pertains to their work, their lives, or their learning. With the *impersonations* structure, however, at least one participant in an online group communicates as a character. These virtual performances are popular for both the actors and the other participants. In an impersonation project for students in Virginia, for example, Robin Gabriel, the education director at Monticello, Thomas Jefferson's home, has impersonated that president by answering students' questions using e-mail. A wonderful archive of sample questions and responses from this project is available through the online Gopher site **Search Letters to Jefferson.**

This kind of activity also can involve students as online characters. Harold House, a social studies teacher at North High School in Eau Claire, Wisconsin, devised a rich role-playing project, **County of Wurtz,** in which he and his students interact in character. The scenario occurs in a medieval land ruled by King Harold Ragnar One-Thumb. Mr. House plays the king's scribe, and the students become inhabitants of the village of Melzar or the town of Draakmar, both in Wurtz County.

Clearly, impersonations provide a rich and motivating way for students to use telecomputing tools to help them explore curriculum-related topics in dynamic and interactive contexts.

Information Collection and Analysis

The most successful educational telecomputing activities frequently ask students to collect, compile, and compare different types of information. With the World Wide Web and its resources increasingly available in K–12 classrooms, this type of educational telecomputing has become quite popular. Please note, though, that these five activity structures—information exchanges, database creation, electronic publishing, telefieldtrips, and pooled data analysis—are essentially telecollaborative. Teleresearch is used only to *support* students' and teachers' learning.

Structure 7: Information Exchanges. Sharing information that is intrinsically interesting to young people on an international scale is an excellent way to engage students in authentic cultural interchange. A great example of curriculum-related information exchange is David Warlick's yearly **Global Grocery List Project**. Participating students around the world find and share the prices for items on a common, virtual shopping list. Classes then use the resulting price lists to discover which items are more expensive in which places. Once these patterns are identified, the students can begin to research and discuss the reasons for these differences in cost.

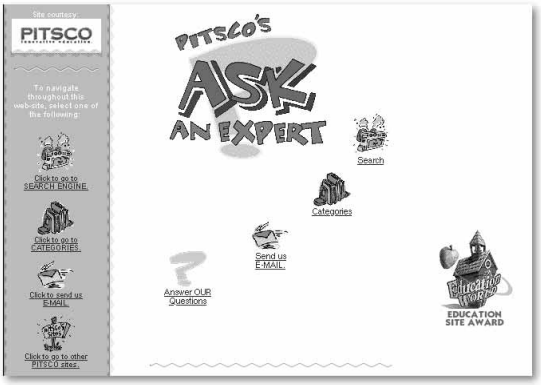
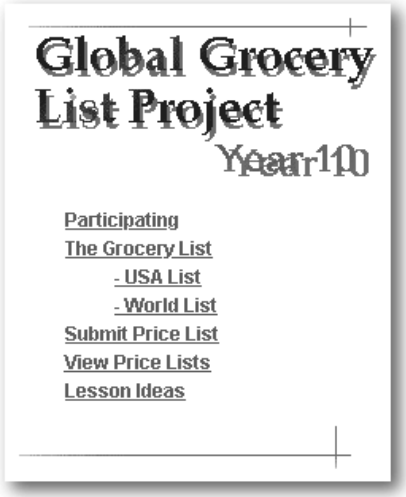


Image Courtesy of Ask an Expert

Information exchanges can involve many classes without overwhelming teachers with time-consuming managerial tasks. Projects such as these are particularly appropriate for telecomputing tools because participating students become creators, consumers, and critics of the information they share.

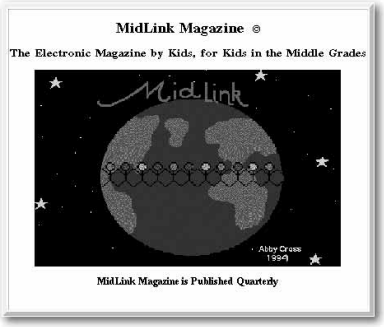
Structure 8: Database Creation. Some projects involve both collecting and organizing information into databases that project participants and others can use for study and analysis. Successful information-exchange activities can "grow" into database-creation activities.

One long-running database-creation project is **Kidlink's Multicultural Calendar**. Since 1994, students from



Reproduced courtesy of Global Grocery List Project

many different countries have contributed database information about holidays celebrated where they live. These records are searchable by month, holiday, country, user-supplied keywords, and author. Entries for September, for example, include Father's Day in Australia, Teacher's Day in Argentina, Independence Day in Mexico, and harvest festivals in South Korea and Israel. This rich and well-organized collection of student-produced information has many possible uses in the classroom.



Reproduced courtesy of MidLink Magazine

Structure 9: Electronic Publishing. Information-collection results can be analyzed in other ways. One of the most popular is through electronic publishing, which includes electronic periodicals (e-zines), report repositories, and online galleries. High-speed Internet access and the proliferation of HTML-authoring tools have made electronic publishing projects possible for the primary grades and beyond. The appeal of an international audience for students' work is powerful, and many examples of electronic publishing projects can be seen online.

One of the best known examples is **MidLink Magazine**, a quarterly e-zine created by and for students ages 10 through 15. Each issue organizes pupils' graphic creations, poems, essays, and short stories around several themes. For example, in February and March 1997, contributors encouraged readers to think about dreams for peace in honor of Dr. Martin Luther King. Other sections in the publication included an egg hunt, a haiku exchange with students in Japan, and a virtual quilt project that invited visitors to "curl up by the fire … and drink a cup of hot chocolate with your cyber-friends." The quilt was virtually created with student-contributed squares and stories that represented their countries, states, and territories.

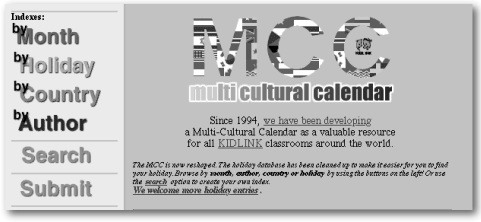
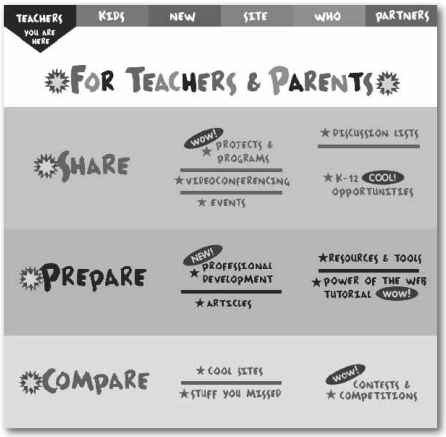


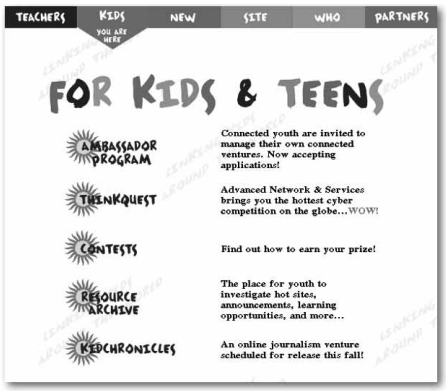
Image reproduced courtesy of KIDLINK.

Structure 10: Telefieldtrips. Although the activity structures that help students collect and analyze information discussed thus far have emphasized comparison and contrast (information exchanges) or collaboration to create a common product (database creation and electronic publishing), information-collection and -analysis activities can also help students experience telepresence; this is the case with what **Al Rogers** has dubbed *telefieldtrips.*

Local fieldtrips can be engaging and beneficial educational experiences, but money and geography sometimes keep schools from using them. The telefieldtrip is a popular online project that can open virtual doors to field experiences that even the wealthiest and most urban students would not be able to have. These rich multidisciplinary and multimedia virtual experiences offer many exciting possibilities.

So far, this type of online project has two variations. In the first, which is also the easiest to organize, students in one location take a local fieldtrip and share their experiences directly with other students who are interested in similar curriculum-related experiences. This type of project also can let remote classes send questions to fieldtrip participants, who try to find answers during their excursions. Excellent examples are the Hong Kong International School's **Virtual China** week-long telefieldtrips in which one group of seventh-grade students visited southern





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China by bicycle and another studied in the ancient Chinese capital of Xi'an. The travelers kept in touch with preregistered classes using both e-mail and a question form at the KIDPROJ site. The travelers were grouped into study teams, and each team focused on a dif-

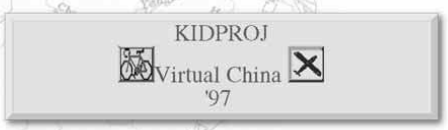
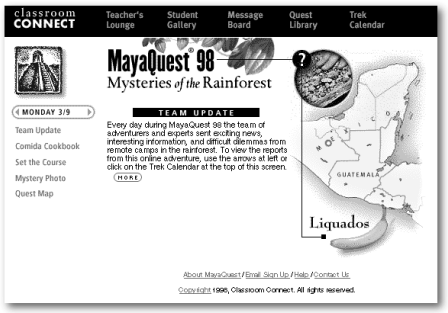


Image reproduced courtesy of KIDLINK

ferent aspect of the Chinese people and their culture. The students shared photos from their trips, their itineraries, and copies of messages that they exchanged with virtual participants.

The second, and by far the most popular, type of telefieldtrip is essentially a virtual expedition. It is usually undertaken by adults who are researching scientific relationships or historical sites. Online participants are invited to experience the expedition, which is usually presented in multimedia form on the World Wide Web, and sometimes participants can remotely join the inquiry process. One of the best known and best developed examples of virtual expeditions is **MayaQuest,** which has frequently followed archaeologists and videographers as they travel by bicycle through Mesoamerica, exploring rain forests and Mayan ruins. Classes that subscribe to this project have interacted with the explorers and helped them solve problems in their work. Rich information was provided on contemporary Mayans—especially children—and their towns, lives, and experiences. Classroom Connect will offer similar adventures with AfricaQuest in October 1998 and GalapagosQuest in spring 1999.

Structure 11: Pooled Data Analysis. In all of the information-collection and information-analysis structures discussed so far, students either vicariously participate in an activity



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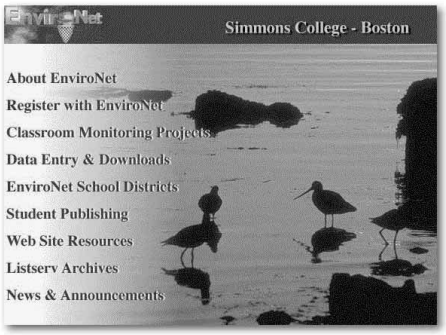
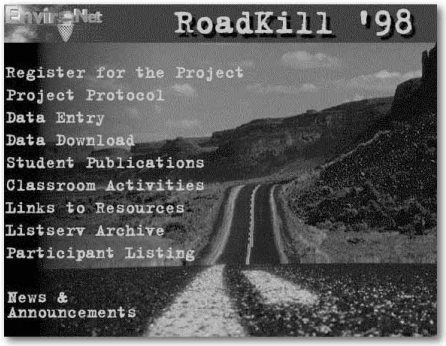
or gather, compare, and contrast information in different forms. The final activity structure in this category encourages learners to *pool* similar data from different locations and then analyze the patterns that emerge from the combined samples.

These sorts of information exchanges are particularly powerful. In the simplest of these activities, students electronically issue a survey, collect responses, analyze results, and report their findings to all participants. Many of the electronic publications at the **National Student Research Center** (Mandeville Middle School, Mandeville, Louisiana) are excellent examples of such reports.





Design and HTML by Paul D. Colombo, EnviroNet Direcor

Pooled data activities have also included projects in which students collect environmental data at many different sites, then combine and analyze it to reveal patterns that help address current scientific challenges. Although many such projects are offered on the Web, **EnviroNet**-sponsored projects are among the best-designed and best-supported. One of the most popular in the United States is **RoadKill '98,** which asks students to report the numbers, types, and locations of animals killed in the streets between the students' homes and schools. Dr. Splatt, the fanciful project facilitator, then helps participants observe, explain, and predict seasonal and incidental patterns of roadkill. EnviroNet also sponsors pooled-data analysis projects that help students track ozone emissions and wild bird species, among others.

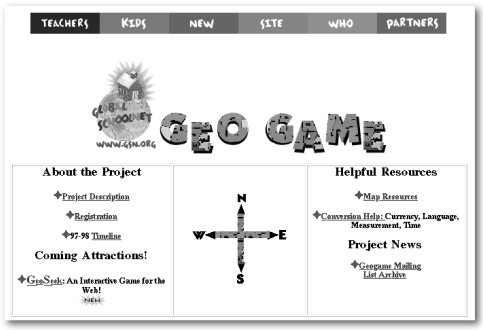
Clearly, this type of project can involve students in large-scale research efforts that use mathematics and scientific methods to answer complex and interesting questions.

Problem Solving

Problem solving is one of the best learning opportunities we can offer students of any age. The Internet can be used to support problem-based learning around the world through information searches, peer feedback activities, parallel problem solving, sequential creations, telepresent problem solving, simulations, and social action projects.

Structure 12: Information Searches. Problem solving online can be competitive or collaborative. In the simplest problem-solving activity, students are given clues and must use either online or more traditional resources to answer questions. These *information searches* are usually structured as competitions, with the winning students or teams being those who correctly answer the most questions by a common deadline.

Probably the longest-running and most well-received information search activity on the Internet is Global SchoolNet's **Geo Game**, which was originally developed by Tom Clauset of North Carolina. Classes that participate in this geography game send in 10 pieces of information about their schools' locations. The project's organizer then scrambles the submitted information to produce two information lists (one of clue sets and the



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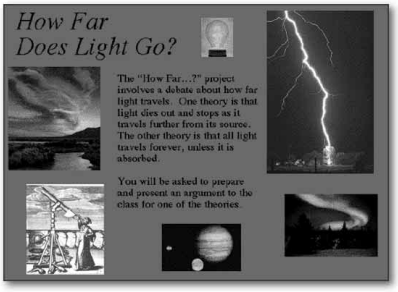
other of locations) that are then sent to participating classrooms. Students have approximately two weeks to use information resources to match clues with communities. The winners are announced by e-mail.

Information searches also can be longer and require extensive and sophisticated research, analysis, and communication activities for participating students. Typically, though, this structure supports deductive and convergent reasoning.

Structure 13: Peer Feedback Activities. In peer feedback activities, participants offer constructive responses to others' ideas and their expression. The **Writers in Electronic Residence** project, for example, helps young Canadian writers respond to each other's poems, essays, and short stories through a national computer-conferencing system. Professional authors work directly with participating classes, adding telementoring to peer feedback and making this collection of activities especially exciting.

Peer feedback activities also can be set up as electronic debates. The **How Far Does Light Go?** project, sponsored by the University of California–Berkeley, is a good example. The project's organizers suggest that middle or high school students use relevant information they find on the Web to prepare position papers about the scientific properties of light, as well as critique other students' statements according to what they understand about light's properties.



Reproduced courtesy of Philip Bell and the KIE Project (NSF and UC Berkeley)

Peer feedback activities also can be successful with young children. In the **MindsEye Monster Exchange Project**, for example, children draw original monsters and use words to describe them. These descriptions are then e-mailed to students in other schools who read the descriptions and then draw what they think the described monsters look like. Both sets of pictures and the descriptions are then displayed in the project's "Monster Gallery," and students communicate with each other about the similarities and differences between the first and second drawings.

Reproduced courtesy of MindsEye Monster Exchange

Structure 14: Parallel Problem Solving. In parallel problem solving, a popular activity structure, students discuss each other's problem-solving processes. A problem is presented to and explored by students in several locations before they come together online to compare, contrast, and discuss their separate problem-solving methods.

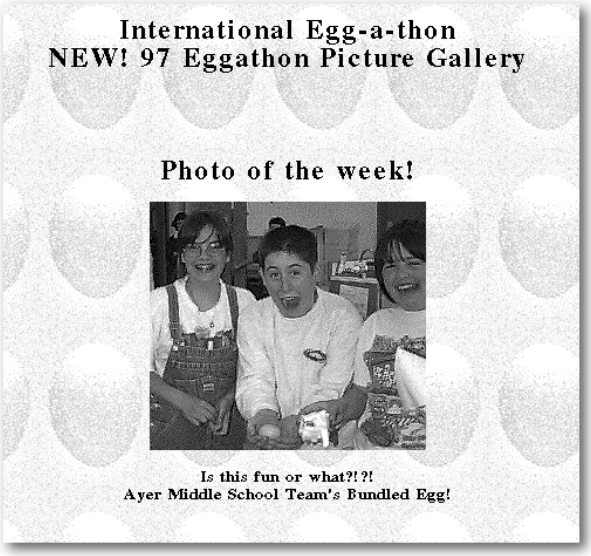
The Electronic Schoolhouse's **International Egg-a-Thon** is one of the most creative and best developed parallel problem-solving projects around. In this collection of related challenges, students use eggs to solve several problems. In the "Bundled Egg Drop," for example, participants must create a holding crate for a raw egg in 30 minutes from a collection of previously assembled materials. The crate is supposed to protect the egg from breaking when the crate is dropped from a standard height. In the "International Egg Toss," teams of students create packages to protect raw eggs when they are sent by surface mail to other participating classes.

Such rich and varied problem solving and discussions of multiple problem-solving methods are becoming quite popular among telecollaborating classes.

Image reproduced courtesy of KIDLINK

Structure 15: Sequential Creations. Students can also interact by collaboratively creating a common work. This is the purpose of *sequential creation.* This intriguing activity structure, a type of artistic problem solving, has participants progressively creating either a common written text or a shared visual image. The structure thus far has been used with a variety of expressive media in support of intriguing collaborative creative efforts.

Kidlink's MIDI Music Relay, coordinated by Stefan Gustafson in Stockholm, offers a good example. The project invites students to add to songs that are progressively built with 30-second MIDI segments as the files travel from person to person on the Internet. In another project, children



Reproduced courtesy of Eggmeister Stewart Clements, The Great International Eggathon

create sequentially illustrated stories one page at a time in **Write and Illustrate a Children's Story,** coordinated by Deborah Falk of Duck Bay, Manitoba.

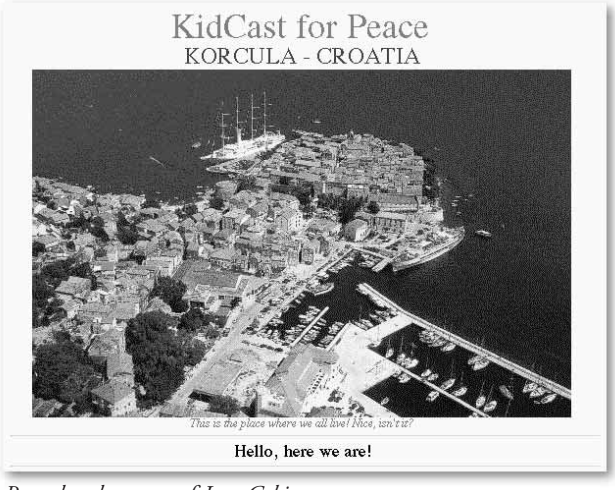
Another good example of the sequential creation activity structure is Rosa Gunnarsdottir's heart-warming **Benni the Bear Around the World.** This project follows a stuffed bear from his packing in a box by Rosa's class in Iceland through his travels from classroom to classroom around the world. As each class receives Benni, the students explore the mementos that previous classes placed into his box, as well as take photos and write short pieces for display on the class's page at Benni's Web site.

Structure 16: Telepresent Problem Solving. Telepresent problem-solving activities bring together participants from different geographic locations and time zones either asynchronously or in real time to participate virtually in a computer-mediated meeting, to use remotely located robotic tools, or to engage simultaneously, without direct electronic contact, in similar activities at different project sites.

Creativity Café's **KidCast for Peace**, for example, shows student artwork and sponsors periodic CU-SeeMe audio- and videoconferences, helping young people from all over the world create and share ways to "make this a happier, healthier, safer and peaceful world." Each Saturday at 18:00 hours Greenwich Mean Time, members of the international **Kidclub** use IRC text chat to discuss current topics that often involve solving such global problems as endangered species, hunger, and poverty. Telepresent problem solving can take many forms and use various types of multimedia to connect students with each other and help them solve real-world problems.

Structure 17: Simulations. This activity type offers students the chance to solve problems in simulated contexts. Online simulations require the most coordination and maintenance of all the projects designed with activity structures, but the depth of learning and task engagement that are possible may convince a project's organizers to spend the extra time and effort needed to make a simulation work well.

Brian McGee's **Electronic United Nations** project, for example, invites classrooms to "become" countries and interact with other participating classes in a simulated United Nations, discussing issues, creating and completing surveys, and crafting and voting on proposals. Participating students and teachers can learn much about global issues, politics, debate, and social ideas. In another simulation—Leni Donlan, Jory Post, and Leslie Christman's **Taking Stock**—classes can develop and monitor the progress of stock portfolios.



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Structure 18: Social Action Projects. *Social action projects* help learners understand and take action to help solve authentic global challenges. As many educators know, the Internet can serve as a venue for "humanitarian, multi-cultural, action-oriented telecommunications projects" (Ed Gragert, **I*EARN**) that involve the future leaders of our planet: our children. Social action projects focus on real and immediate problems and often propose that students take action to help solve a problem, rather than simply stop learning once they understand it.

Many examples of social action projects can be found online. Some are sponsored by I*EARN, such as the multinational **Holocaust/Genocide Project**, which explores the Holocaust in Europe during World War II among other genocidal incidents in history. Students aged 12 to 17 are guided by mentors as they study genocide and participate in teleconferences. Through these conferences, the students publish *An End to Intolerance,* an annual magazine. They also have the option to take a two-week study trip to Poland, the Czech Republic, and Israel, an annual event occurring each spring near the Passover holiday.

I*EARN also sponsors **The Rope PumpProject: Clean Water for Nicaragua**, a long-running venture that provides rope-operated water pumps to villages in Nicaragua,

Images courtesy of the Earth Day Groceries Project

using money raised by U.S. classes. After a pump is installed, children from the village communicate with the students who bought the pump, describing the way village life has changed as a result.

Many social action projects focus on environmental issues. The annual **Earth Day Groceries Project**, for example, coordinates the efforts of thousands of U.S. elementary students to decorate grocery bags with images and text to increase environmental awareness. These bags are filled with groceries and passed out in the children's communities each year on Earth Day (April 22). Nina Hansen's annual international **Save the Beaches** project, which is supported by the University of Hartford in Connecticut, helps students who live in coastal communities clean their local beaches and generate data on the quantities and types of litter found. Project participants share the data and try to detect general patterns. After analyzing these patterns, the students share their suggestions on how to reduce excess amounts of particular types of litter.

Potentials

The potential in these projects for multidisciplinary, forward-thinking, and truly collaborative learning is awesome. Many of the more sophisticated projects—by being interdisciplinary, authentic, and active—focus participants' attention on the problems rather than on the telecommunications technologies used to share information with distant collaborators. This clear emphasis on curriculum-based learning, rather than technologies, is one of the characteristics that makes *all* types of telecollaborative projects so potentially powerful. ■

References

Levin, J. A., Riel, M., Miyake, N., & Cohen, M. (1987). Education on the electronic frontier: Teleapprentices in globally distributed educational contexts. *Contemporary Educational Psychology, 12*, 254–260.

Riel, M., & Harasim, L. (1994). Research perspectives on network learning. *Machine-Mediated Learning, 4,* 91–113.

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INTRODUCTION

Virtual Architectures Web Home
ccwf.cc.utexas.edu/~jbharris/Virtual-Architecture/

INTERPERSONAL EXCHANGE

Structure 1: Keypals

The Hobart-Malang Electronic Mail Project
anfi.pacit.tas.gov.au/fahan/Compute/indo.html

IRC Users Central
light.lightlink.com/irc/index.html

Structure 2: Global Classrooms

Read to Write Project
www.itdc.sbcss.k12.ca.us/projects/kreider/index.html

Desert and Desertification
environment.negev.k12.il/desert/desert.htm

Earth's Crust and Plate Tectonics
environment.negev.k12.il/platline.htm

Structure 3: Electronic Appearances

CU-SeeMe
www.indstate.edu/msattler/sci-tech/comp/CU-SeeMe/index.html (free version)

www.wpine.com/Products/CU-SeeMe/ (updated version)

Women of NASA
quest.arc.nasa.gov/women/intro.html

Structure 4: Telementoring

Hewlett Packard's E-Mail Mentor Program
mentor.external.hp.com/

Electronic Emissary
www.tapr.org/emissary/

Lanier Middle School's Electronic Emissary Project
www.rice.edu/armadillo/Schools/Lanier/EEP/

Structure 5: Question-and-Answer Activities

Ask an Expert
www.askanexpert.com/askanexpert/

Structure 6: Impersonations

Letters to Jefferson
gopher://pen.k12.va.us:5000/11/Pav/SocStudies/Jefferson/Letters

County of Wurtz
www.ecnhs.org/dept/socstudies/wurtz/Wurtz.html

INFORMATION COLLECTION AND ANALYSIS

Structure 7: Information Exchange

Global Grocery List Project
www.landmark-project.com/ggl.html

Structure 8: Database Creation

Kidlink's Multicultural Calendar
www.kidlink.org:80/KIDPROJ/MCC/

Structure 9: Electronic Publishing

MidLink Magazine
longwood.cs.ucf.edu/~MidLink/

Structure 10: Telefieldtrips

Al Rogers
www.gsn.org/who/team/ar.bio.html

Virtual China
www.kidlink.org/KIDPROJ/VChina97/

MayaQuest
www.classroom.com/

PROBLEM SOLVING

Structure 11: Pooled Data Analysis

National Student Research Center
members.aol.com/nsrcmms/NSRC.html

EnviroNet
earth.simmons.edu/

RoadKill 98
earth.simmons.edu/roadkill/roadkill.html

Structure 12: Information Searches

GeoGame
www.gsn.org/project/gg/

Structure 13: Peer Feedback Activities

Writers in Electronic Residence
www.edu.yorku.ca/WIERHome.html

How Far Does Light Go?
www.kie.berkeley.edu/KIE/web/hf-description.html

MindsEye Monster Exchange Project
www.win4edu.com/minds-eye/monster.html

Structure 14: Parallel Problem Solving

Electronic Schoolhouse's International Egg-a-Thon
www.eggathon.com/97/eggathon_home.html

Structure 15: Sequential Creations

Kidlink's MIDI Music Relay
www.kidlink.org/KIDPROJ/Midi/

Write and Illustrate a Children's Story
www.mbnet.mb.ca/~dfalk/Writing.html

Benni the Bear Around the World
www.kidlink.org/KIDPROJ/Benni/

Structure 16: Telepresent Problem Solving

KidCast for Peace
creativity.net/kidcast2.html

Structure 17: Simulations

Electronic United Nationsp
www.simulations.com/eun/index.htm

Taking Stock
www.santacruz.k12.ca.us/~jpost/projects/TS/TS.html

I*EARN
www.iearn.org/iearn/

Structure 18: Social Action Projects

Holocaust/Genocide Project
www.igc.apc.org/iearn/hgp/

The Rope Pump Project: Clean Water for Nicaragua
www.iearn.org/iearn/projects/pump.html

Earth Day Groceries Project
www.halcyon.com/arborhts/earthday.html

Save the Beaches Project
ednhp.hartford.edu/WWW/Nina/Beaches2.html