Case Study

Brazil

RiverWalk: Online, Interactive Learning

Eric Rusten and Vera Suguri
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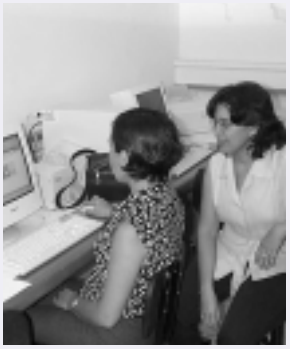
Educational technology initiatives are taking learning to a whole new level, enabling teachers and students around the world to interact with one another in global classrooms. While those of us who are products of fairly traditional schooling may read, with a justified sense of wonder, about live video-conferences with astronauts in space and email exchanges with leaders around the world, educational researchers have not analyzed the process or ascertained the impact of most such experiences. The RiverWalk Project is an exception.

Conceived in Japan, The RiverWalk Project was born at the University of Michigan's College of Education. It is an international, interactive, and interdisciplinary initiative based on project- and problem-based learning principles, which are deftly applied on the multilingual RiverWalk web site. Building on this platform, educators in Brazil not only participate in the program but, in collaboration with LearnLink's Learning Technologies Network (LTNet) project, also have turned it into a web-enabled form of professional development for teachers.

The story of RiverWalk-Brazil explores the two primary dimensions of the program: the online forum, geared for students and developed by the University of Michigan, and the online professional development and collaborative learning environment for Brazilian teachers, developed by LTNet. The story describes an educational technology initiative grounded in sound learning theory, illustrates the potential of international partnerships for learning, and proves, without a doubt, just how much fun learning can be.

“My impression is students were very interested because of the Internet. They said, ‘Wow, so now we have the opportunity to interact with students across the country. They can see the results of our work.’ The other thing is that they loved the field trip to rivers. . . Many are from poor schools, so they don’t do this very often.”

Eduardo Junqueira



“Through River Walk-Brazil, our schools have opened the windows to the world.”

Vera Suguri

Box 1

Global Learning

Naoko, a twelve-year old girl in Japan, browses the Internet and stumbles upon an online account of a group of Brazilian youth trying to save their local river. As Naoko clicks through the digital photos and journal-like text the schoolchildren published, she gets a glimpse of the cultural, economic, and ecological issues their town faces. She views a photo of townswomen who earn their living by washing clothes in the river. She learns from the children's own words that they are concerned that the soap from the clothes will harm the river's ecology and that the backbreaking work will harm the health of the women who labor on the river's edge. Naoko's eyes light up when she reads that to help solve their community problem, the compassionate Brazilian children published and disseminated river education booklets and are encouraging the city council to build a public laundry facility for the washerwomen. Naoko begins thinking about the river that runs by her own neighborhood…

RiverWalk: Making a Splash at the University of Michigan

The RiverWalk Project is an ongoing, collaborative project in which students and teachers from six countries—including Brazil—research and share information about rivers in their communities. The project was born out of a desire of Japan's Ministry of Land, Infrastructure, and Transport to develop an international education program on rivers. The Interactive Communications & Simulations group (ICS) at the University of Michigan's College of Education was approached for assistance because of its twenty year history incubating and implementing innovative learning experiences for school children around the world. With funding from the Japanese government and support from various entities at the University of Michigan, Jeff Kupperman and his colleagues from the ICS group launched the RiverWalk project in November 2000.

A visit to the multilingual RiverWalk web site (www.ltnet.SchoolLinks/VEE/RiverWalk/P_AAC_RW_Base.htm) allows one to view the results of project- and problem-based learning, as well as an integrated set of easy-to-use tools employed to publish work and carry out discussions. The web site features student-published tours (mini-web sites) presenting projects about their local rivers, accompanying discussion boards for other RiverWalk participants, *virtual backpacks* that allow participants to take and synthesize material from each other's online tours, project facilitation by mentors at the University of Michigan, and a downloadable manual to help schools get started with their project. Currently, funding from Japan makes it possible for schools to participate in the project free of charge. While many web tours are publicly accessible, some portions of the site are password protected.

Some of the big questions RiverWalk students explore include

- Why have so many civilizations grown up around rivers, and how have the relationships between various societies and rivers changed over time?
- What does it mean for a river to be "clean" or "polluted?"
- What happens when countries or other political units compete for limited water sources?
- How do societies choose to live with rivers? What decisions need to be made about how to reap various benefits from rivers while controlling

their potential for destruction?
- What does it mean to take environmental action in your community, and what can a class of students do?
- What can rivers mean to people, aesthetically, culturally, or personally?

One RiverWalk partner, Vera Suguri, captures the project's potential impact with the following observation:

For students to learn about conservation, it isn't enough to talk about the problem, show the situation via TV and videos, or by providing information in a traditional manner. Working with projects like RiverWalk, the students become active participants. Teachers and students decide together about what river to study and how to study it. In our case, the participants went to visit the rivers they were studying. In one school, students interviewed local fishermen who had lived on the river's banks for over two decades. The reality of river dependence was seen and felt. After viewing other schools' projects, our students realized the extent of river problems in our country as well as others.

Brazil Participates In Something New

RiverWalk already had participants from Japan, Taiwan, the U.S., Canada, and Israel when a Brazilian journalist studying at the University of Michigan began recruiting schools from his homeland to join the project. Eduardo Junqueira, a visiting student with the University of Michigan Journalism Fellows Program, asked Vera Suguri from the ProInfo program[1] in Brazil's Ministry of Education to help identify and encourage teachers from fourteen public schools to join the RiverWalk project. The fourteen schools were strategically selected to represent the diverse economic, geographic, and cultural diversity of the country and to ensure that all the great rivers of Brazil would be included. The common thread among the selected sites is that each has a highly motivated teacher leader and that each school has access to Internet technology—if not in the school itself then at a local computer resource lab developed under the ProInfo program.

With RiverWalk, Suguri saw an opportunity not only to get Brazil's schoolchildren and teachers involved in an international, cross-curricular, educational technology project, but also to develop a meaningful, web-enabled form of professional development for the teachers within and outside the project. Suguri brought in the US./Brazil Learning Technologies Network (LTNet), part of the LearnLink project,[2] to help develop a web-based collaborative learning environment *(AAC - Ambiente de Aprendizagem Colaborativa)* for Brazilian educators participating in the project.

While separate from the RiverWalk web site, the AAC in the LTNet web site (http://www.ltnet/SchoolLinks/VEE/Riverwalk/P_AAC_RW_Base.htm) advances RiverWalk's goals by providing an environment for professional development tailored for the Brazilian teachers involved in RiverWalk. The AAC is easily accessible to everyone, whether or not they are officially involved in RiverWalk. ProInfo's Suguri sees this feature as a way to model good professional practice and to help teachers who are just beginning to use technology learn to develop and participate in projects. Moreover, the site is accessible to researchers and environmental specialists to allow them to contribute to the schools during the learning process. Regarding this feature, Sugari comments, "It is not usual for teachers and students to accept contributions from outsiders during the learning and teaching process. I think that this aspect is very innovative. Through the AAC, this collaboration is achieving a larger return on the investment of the work of the eleven participating Brazilian schools."

A visit to the teachers' collaborative learning environment (AAC) gives a taste of the sometimes messy process involved in adopting new learning technologies. To help teachers plan activities together and exchange thoughts about the process, the collaborative learning environment includes four guiding questions[3]:
- What do we know?
- What do we want to learn?
- What did we learn?
- How did we do it?

The AAC also provides teachers with several technologies to help them explore the four questions: a listserv, chat rooms, a photo gallery, and a user-friendly "webfolio," where teachers upload text and graphics. Suguri selected teacher trainers from two of the eleven active sites, Lourdes Matos of Montes Claros and Noara Resende of Belo Horizonte, to be *madrinhas* (literally, *godmothers*) or

activity coordinators for the teachers in the other sites. Staff in the US and Brazil trained the *madrinhas*, mostly online, to use the technologies in the collaborative learning environment, and the *madrinhas*, in turn, trained the rest of the participating teachers to use their environment in a similar manner.

The culture of the AAC is marked by teacher autonomy in decision-making while maintaining a highly cooperative work environment. According to Suguri, teachers "weren't obliged to follow any pre-determined structure. They decided what river to study, number, grade and level of participants, who would be interviewed, what places or institutions to visit, the size and feature of their own project, etc." However, it is not uncommon for teachers with higher computing skills to assist those with less experience, for teachers to send encouraging emails to each other, or to bounce ideas off of colleagues online.

Dynamic Learning

According to one project developer, the dynamic learning that RiverWalk nurtures requires "many actors." Without a balanced human and technical infrastructure, the project would have suffered. Table 1 delineates the roles of each of the partners in the RiverWalk-Brazil project.

Instructional Technology Framework

One may study RiverWalk-Brazil by applying a

Table 1 Key Partners and Roles

Partner	Roles
Teachers and students at the eleven participating schools in Brazil and their related ProInfo teacher training and technology resource centers (NTE's)	• Convene the RiverWalk project's Brazil participants. The teachers and students at these schools are responsible for developing and publishing content on the RiverWalk web site. Teachers at these schools collaborate with each other via the collaborative learning environment (AAC) housed on LTNet's web site. • Organize educational activities and field trips to enable students to explore and learn about their river. The teacher trainer/coordinators at the ProInfo NTEs provide technical and logistical support to the schools.
RiverWalk-Brazil coordinator Eduardo Junqueira and staff at the Interactive Communications & Simulations (ICS) group at the University of Michigan's College of Education	• Developed the RiverWalk web site (http://www.riversproject.org). • Developed the general framework and guidebook for the RiverWalk project for countries around the world. • Tailored and translated the web site and guidebook to be sensitive to Brazilian culture. • Provided a common space for Brazilian schools to present their work in an international forum alongside other countries. • Facilitated and coordinated day- to -day communications. • Built trust with Brazilian teachers. The RiverWalk coordinator for Brazil, Eduardo Junqueira, is a Brazilian journalist studying at the University of Michigan. It was reported that teachers felt they could trust him and that he "looked out for their best interest" largely because he was "one of them."

popular framework from the instructional technology literature: Grabinger's concept of rich environments for active learning ("REALs"). REALs emphasize the social component of learning as well as the authenticity of the context in which this learning takes place. As Grabinger explains, "To create REALs, teachers must involve their students, parents, administrators, and colleagues in planning and implementing strategies that encourage student responsibility, active knowledge construction, and generative learning activities on a large scale and in a variety of methods and forms" (1996, p. 688).

Both components of RiverWalk-Brazil—the original Interactive Communications & Simulations group-developed RiverWalk framework and the ProInfo/LTNet-developed teachers' Collaborative Learning Environment (AAC) can be analyzed in the REAL framework. It is why this project has more pedagogical muscle than many similar endeavors. Table 2 (overleaf) outlines the main attributes of REALs and some manifestations of each attribute in RiverWalk-Brazil initiative. For easy identification, technology tools are in bold.

Perspectives and Lessons

In any educational innovation, there are interesting perspectives and lessons that emerge during actual project implementation. The quotations from project participants help illustrate what it is like to be part of RiverWalk-Brazil.

Table 1 **Key Partners and Roles** *(continued)*

Partner	Roles
Vera Suguri, a pedagogical coordinator at ProInfo, a national educational technology initiative within Brazil's Ministry of Education.	• Used ProInfo's network of teacher training and technology resource centers and participating schools to identify suitable participants for the RiverWalk-Brazil project. • Facilitated communication among: a) teachers to encourage active participation and b) all project partners to coordinate project efforts. • Brought innovation and pedagogical input into the project, including co-designing the teachers' collaborative learning environment (AAC). • Gave a national presence for the project by presenting at conferences and building relationships with principals, State Secretaries of Education and local coordinators. It was stated that people in Brazil take RiverWalk more seriously because it is a ministry-associated activity.
Eric Rusten, Director of the U.S./Brazil Learning Technologies Network (LTNet), part of the LearnLink project at AED	• Developed and maintains the online Collaborative Learning Environment (AAC) where teachers collaborate as they implement the RiverWalk project (http://www.ltnet.org/SchoolLinks/VEE/RiverWalk/P-AAC-RW-Base.htm). • Brought technical and pedagogical innovation to the project. • Acted as an equal partner with the Ministry of Education and schools of Brazil.
Local communities throughout Brazil	• Companies, forestry organizations, museums, families, community associations, and foundations lend support to the project in a variety of ways, from making lunches for student field trips to serving as subject matter experts for students and teachers.

Table 2 **Attributes of Environments for Active Learning**

Attributes of rich environments for active learning	Manifestations in ICS's STUDENT-focused RiverWalk framework	Manifestations in ProInfo's/LTNet's TEACHER-focused Collaborative Learning Environment (AAC)
Constructivist influences People learn by making connections between old and new knowledge, indexing and making generalizations from new knowledge, and developing common understandings of new knowledge through social interaction with peers.	Students synthesize and evaluate new learning about rivers to develop effective web tours comprised of narrative descriptions, pictures and hyperlinks. Cross-curricular connections encourage the natural flow of learning. For example, measuring the effect of droughts on rivers can include math objectives, e.g., measuring river depth, social studies objectives, e.g., analyzing economic impact of drought, and creative writing objectives, e.g., writing about drought from a fish's perspective. Easy to use publishing tools and simple moderated discussion boards allow students to focus on synthesizing content rather than on technological tasks.	The webfolios are easy-to-use online publishing tools that enable teachers and students to instantly publish text and graphics to create mini webpages that document the process of the project. The "add a comment" function on each page of the webfolios provides a forum where others can articulate the new connections their colleagues' webfolio page helps them make. Also, the AAC's listserv and chat room provide two communication mechanisms for participating teachers to plan activities, discuss difficulties, receive training inputs, and share results.
Authentic learning contexts Learning that takes place in an authentic (not simulated) context, is relevant to students' lives, can develop richer cognitive connections, and support collaboration.	Students work in virtual workgroups to identify, analyze, and/or resolve river issues in their own communities, much like scientists, government agencies, and concerned citizens do. A "virtual backpack" feature allows students to grab graphics, sound, and text from others' web tours to include in or help inform their own web tours.	Teachers are motivated to participate in the community because they want their classrooms to do well on the RiverWalk project. The questions and concerns they express via email discussion lists and chat are based on a real, simultaneous classroom experience. Because peer trainers *("madrinhas")* work as members of the collaborative team, they can provide contextualized and authentic professional development opportunities.

Table 2 **Attributes of Environments for Active Learning** *(continued)*

Attributes of rich environments for active learning	Manifestations in ICS's STUDENT-focused RiverWalk framework	Manifestations in ProInfo's/LTNet's TEACHER-focused Collaborative Learning Environment (AAC)
Student responsibility and initiative Students participate in intentional, goal-directed learning. In doing so, they self-reflect and develop metacognitive skills.	Students are encouraged to use discussion boards to critique their own work and that of their peers, thereby giving them an opportunity to think about the learning process that RiverWalk affords. The downloadable RiverWalk guidebook encourages students to take action in their community and highlight their initiative in their web tours.	Using questions about learning objectives to organize participation in the online learning environment encourages teachers to publish their new learnings in the webfolio. Their suggestions for improving the learning environment web site (e.g., adding features, launching particular discussion topics) are easily sent from teachers to web site designers via chat and email.
Cooperative learning Students work together to solve problems, taking on multiple roles, and working steadfastly through difficulties while doing so.	The workgroup interface, discussion boards, and "virtual backpack" give students multiple ways to lend their expertise and support each other in the learning process.	Mutual rules of engagement help build an online environment in which teachers feel safe to seek help from each other and offer help without overshadowing others. Chat events give teachers the immediate back-and-forth conversation they need while the listserv serves as a convenient way to send questions, share results, and schedule other online activities with the whole group.
Generative learning activities Students actively use tools to investigate problems and seek solutions to problems. In these situations, students are often co-designers of instruction alongside teachers.	Ideally, RiverWalk students identify the river issues that matter most to them. The Internet allows students to freely search other external online resources (such as web sites with relevant maps, geological information, and economic insight). In doing so, they are not passive recipients of knowledge; rather, they become active solution seekers and creaters of new knowledge.	The site contains a variety of resources, including instant publishing tools that help teachers take ownership of the environment and generate ideas, as well as links to other sites that support their online experimenting and exploring.

Table 2 **Attributes of Environments for Active Learning** *(continued)*

Attributes of rich environments for active learning	Manifestations in ICS's STUDENT-focused RiverWalk framework	Manifestations in ProInfo's/LTNet's TEACHER-focused Collaborative Learning Environment (AAC)
Authentic assessment The focus is on process as well as product in student learning.	The emphasis on problem-based learning allows for performance-based assessments such as rubrics. The online medium captures and preserves students' published web tours as well as their participation in online discussions.	The online medium exposes the teachers' learning process, thereby making it easier to evaluate their level of participation and professional growth. Peer online trainers *("madrinhas")* are visible in the community and use various online communications tools to keep in regular touch with teachers, helping them as they begin adopting new technologies.

Teacher Growth

Eduardo Junqueira, the journalist and Interactive Communications & Simulations group-based mentor that coordinated Brazilian classrooms' participation in the RiverWalk web site, said that when the Brazilian teachers were first approached about the RiverWalk project,

…the teachers were very proud to join the project but very scared that they might not succeed. 'Are you sure I can do this?', 'I'm not sure.' I told them, 'If we don't try, we'll never know.' Then, slowly, they started trusting. They had experience in the past with foreign partners, and in some cases they had bad memories. How did I gain their trust? I answered their emails, gave feedback, tried solving their problems. Once trust was established, they started their projects---field trips, interviews, pictures.

One teacher shared her perceptions of her own skill growth during the course of the project:

When I stated participating in the RiverWalk project, I didn't know even to type, and now I am learning to scan pictures, navigate in the Internet, and many other things in computing.

Another teacher, commenting on the impact of RiverWalk participation on him and his students, states:

The participation in the RiverWalk project brought great advances in the teaching and learning process and helped develop ecological consciousness and citizenship in our students…When I showed the RiverWalk project to the city council, they were very embarrassed with the pollution of the River Jaguaribe and tried to justify [overlooking it].

Programmatic Issues

RiverWalk mentor/coordinator Junqueira reflects on how he helped teachers become accustomed to communicating online:

Sometimes we [participate in online] chat. I 'talked' teachers through it as they were uploading pictures, etc. Since we are working online, I told them, 'You have to tell me exactly what's on your screen for me to know what the problem is.' This was a new type of communication for them. After a while, they realized it was not so hard.

LTNet's Director, Eric Rusten, sheds some light on critical elements contributing to the effectiveness of the teachers' collaborative learning environment (AAC):

The online environment used for the RiverWalk project was not entirely predetermined. Teachers could request changes, which would be implemented quickly. If it took two days to implement the change,

it may be too late. Being responsive to participant needs and suggestions builds a strong sense of ownership and helps sustain enthusiasm and project momentum. For example, during one of many online discussions, the teachers decided that they needed to add a fourth key question to the Webfolio. Within two days the system was redeveloped to include this new question. We have no ego invested in this project. We change the environment according to what they [the teachers] want.

Explaining why it was important to have a broad spectrum of Brazilian schools involved, Rusten states:

By enabling different types of schools to participate, more innovation is possible. One teacher, for example, used what we called "scooter net" to enable her students to have their content published in the RiverWalk web site. After having the students write up their narratives and identify images for their tour, the teacher drove her scooter to the ProInfo computer resource and training center in a nearby city, uploaded the files to the web site, and printed copies of the completed pages so the students could see the results of their effort. Vera Suguri also selected different schools to demonstrate that anyone could participate; she included a school for at-risk street children and a school for children with hearing impairments. She also selected state and municipal schools. The result was to send the message: 'You don't have to be from the capital; you don't have to be rich to be involved.' There are no excuses not to participate in collaborative learning projects.

Project *madrinha* Noara Resende, who serves as a trainer and facilitator for teachers, makes an observation on the role of local support for RiverWalk:

Other important partners are the school directors and the students' parents. Many of the directors reacted positively and got the whole school community involved. Many of the parents have sent me thank you messages, and even want to see some of the student work published on the Internet. Everyone's collaboration makes it easier for teachers and students.

Project *madrinha* Lourdes Matos comments on the importance of evaluation in the RiverWalk-Brazil.

The students' evaluation is an essential part of the project because the activities are designed according to students' progress and needs. It is the teacher's responsibility to assess students and plan accordingly. A final evaluation will take place at the end of the project. The purpose of that will be to assess student learning and help students and teachers reflect on the process, as both parties are responsible for the knowledge produced during the course of this project.

Student Growth

Junqueira describes students' initial reactions to the project:

My impression is students were very interested because of the Internet. They said, 'Wow, so now we have the opportunity to interact with students across the country. They can see the results of our work.' The other thing is that they loved the field trip to rivers. There are animals, there are trees, they have each other, they have a picnic. Many are from poor schools, so they don't do this very often.

One teacher for at-risk students observed that:

…this project elevated the self-esteem of the kids because they realized that they could do the same work as others. Their pictures and researches are on the Internet, so they are "important citizens" who are contributing for the future generations.

Finally—and perhaps most importantly—are the chat excerpts from school children themselves. Below are the comments from students from various Brazilian schools:

…No, we are concerned with pollution issue and, before throwing trash away on the street, we will think first.

…If the trash from here goes there, the trash from there comes here. Indirectly, we are helping to preserve Sao Francisco River because our school has collected 10,000 disposable bottles, which surely would get there through Velha's River.

…It was great to visit the river because it helped us to raise questions and learn more on subjects which, before the visit, we didn't use to care about.

…Huron River is practically the same as Sao Francisco River in the quantity of water because we already can see the sand banks in some parts of the river!!!

Conclusion

"Through RiverWalk-Brazil, our schools have opened the windows to the world," states ProInfo's Vera Suguri. As the project demonstrates, forming and using partnerships are integral to this type of educational innovation. Doing so helps participants' get the support they may need to make the innovation their own. Many times, information and communications technology can bolster learning environments such as RiverWalk. However, while technology can help learners do things that may have been impossible earlier, technology does not automatically improve learning partnerships. Only people can do that.

References

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Notes

List of Schools Participating in RiverWalk-Brazil
River - **State**

Manuas – **Amazonas**
Escola E.M. Carlos Gomes
Escola E.M. Armando de Souza Mendes

Jaguaribe - **Ceará**
Escola E.E.F.M. Cornélio Diógenes

Basilia - **Distrito Federal**
PROEM

Montes Claros – **Minas Gerais**
Escola Antônio Canela
E.C.E. Capelo Gaivota

Belo Horizonte - **Minas Gerais**
Escola E.M. Hilda Rabello Matta

Campo Grande - **Mato Grosso do Sul**
Escola E.M. Barão do Rio Branco Pólo
Escola E.M. Oito de Dezembro

Campos - **Rio de Janeiro**
Escola C.E. Dom Otaviano de Albuquerque

Tapera - **Rio Grande do Sul**
Escola Oito de Maio

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Footnotes

[1] ProInfo is a national program, started in 1997, that works in partnership with state and local authorities to establish a network of teacher training and technology resource centers across the country, build computer labs in public primary and secondary schools in all states, and train thousands of trainers and teachers to integrate technology into all aspects of the curriculum.

[2] The LTNet activity was part of a seven-year Indefinite Quantities Contract (No. HNE-I-00-96-00018-00) of the US Agency for International Development (USAID). It was funded by the USAID Bureau of Economic Growth, Agriculture, and Trade (EGAT) and Office of Energy and Information Technology (EIT), and other USAID Bureaus, offices, and missions. It was operated by the Academy for Educational Development.

[3] The first three questions are based on the KWL technique developed by Professor Donna M. Ogle at National-Louis University. Originally, Junqueira had asked teachers to answer these questions on paper, but it was suggested later that putting them in a public online format would be more beneficial for all teachers involved in the project.