Editor's Note: The following article is reprinted (with updated format editing) from the archives of the Phi Beta Delta International Review, Volume VI, Spring 1996, pp. 77-87. The International Review is the predecessor of the current publication. It is re-printed here to provide international educators with an historical view of scholarship on internationalizing the classroom.

Using the Internet to Create International Experiences for Students

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The Internet is a high-speed communication link incorporating computers, networks and users throughout the world via TCPLP (Transmission Control Protocol/Internet Protocol) which allows dissimilar systems to interoperate (Krol,1992). The use of Internet is progressing rapidly as interfaces become more user-friendly. Recently, manuals guiding the use of Internet have become widely available as new avenues continue to be explored and developed. However, before such manuals became widely available, information guiding the usage of Internet was passed by word of mouth and trial and error. Accordingly, a major hinderance to use of the Internet has been reticence of the uninitiated to jump into the world of trial and error. Although nearly 10 percent of the population at Iowa State University is comprised of international students, there is often a lack of interaction with the Iowans with whom they study. Also, Iowa students are predominantly from small towns or rural backgrounds, are usually self-sufficient, and have not previously placed a high value on travel and global issues.

In 1994, an international Internet experience began at Iowa State University in the College of Education as the result of a search for a potential method of increasing international awareness within the curriculum. Funding was provided by a $20,000 Internet Exchange Project grant from the Provost's Office. It enabled the installation of full Internet. The college goal was to find a means of increasing student international awareness and interaction, and if possible share this dream and show the possibilities to other professors in hope that others would "catch the vision" and get involved.

Creating international activities for students is important so students can experience global interdependence first hand, and come to realize the need for a greater understanding and acceptance of diversity. In an article published in the Phi Beta Delta International Review, Wolansky (1992 Fall-1993 Spring) advocated infusing global education into the curriculum and elaborated on organizational methods wherein dimensions or themes of global education could be utilized (Figure 1).

Figure 1

Wolansky's detailed expansion of dimensions or themes of global education (Phi Beta Delta International Review, 1992-93, 15)

Harvey's Dimension	Kniep's Proposal	United Kingdom Model	Iowa Guide to Integrating Global Education
• Knowledge of Global Dynamics	• Global System	• Global Interdependence Interrelatedness	• Global Interdependence
• Cross-cultural Awareness	• Human Values	• Development	• Human Resources, Values & Culture
• Awareness of Human Choices	• Global Issues and Problems	• Environment	• Global Environment and Cultures
• State of the Planet Awareness	• Global History	• Peace and Conflict	• Conflict Management
• Perspective Consciousness		• Rights and Responsibilities	• Change and Alternative Futures

Each of these dimensions or themes of global education is expanded in detail within the original sources cited in the reference.

Wolansky viewed some broad topics or themes as "…as being essential and basic to organizing global education instruction regardless of discipline" (1992, 15). As shown in Figure 1, the dimensions common to the four global models are important to the international Internet experience in this study. For example, several specific themes are addressed in the Internet experience: knowledge of global dynamics and interdependence, cross-cultural awareness, awareness of human choices, perspective consciousness, and conflict management. Indeed, Kniep (1989) notes that people's values are shaped by their experiences. It is the present author's belief that this process can be accelerated when students benefit from guidance provided by teachers who understand the process of globalization.

Traditionally, most attempts at internationalizing involved the physical relocation of people in exchange programs at a great expense; however, electronic exchange could occur much more inexpensively. Currently, Internet technology is in place at many institutions of higher education; moreover, in this endeavor, students and professors realized it was an underused doorway to the world. Through the Internet, students and teachers have the opportunity to share experiences and gain insight from open discussions about similarities and differences among the peoples of the world in topics ranging from purely academic to social and personal. McCue (1989) raises the perspective that, by engaging in international interactions, global perspectives can become deeply personal. In the Iowa State project, these global perspectives were gained by students who participated in the Internet experience. Some experiences became deeply personal.

Unanticipated Global Education Spin-offs of the Internet Experience

The highlights of Internet experience in this study were the many exciting global education spin-offs that propelled students to share their knowledge gained from traveling the

Internet highway. An Israeli applied mathematics student, who was communicating on the Internet, expressed a desire to visit Turkey for his spring university break. Another student communicating via the Internet was Turkish. When the desire was communicated to this student, it resulted in a Muslim family hosting an orthodox Jewish student from Israel for a six-day visit in Turkey.

In another venture, a sub-network of math students was formed including an American from Northern Illinois, a Singaporean at the National University of Singapore, an Israeli and a student from Finland. This group was initiated by students at Iowa State University whose instructor shared e-mail addresses of students with common interests in math.

In a third group, marketing, economics and management students, including a Greek currently studying in England, and a British student and an Australian, were brought together to discuss issues. Finally, a student at Iowa State University (ISU) helped a Turkish student who expressed a desire to continue graduate studies in the United States to contact the Graduate Admissions Office and the International Students Office at ISU. This same student is now requesting information for other students in his school who are also interested in attending ISU.

In general, all the students who traveled the Internet highway found their global counterparts to be concerned about similar issues common to humanity. Students enjoyed discussions about foods native to different parts of the world, the weather, and they were particularly interested inn social habits of students from other countries. They found that all students have basic concerns about financing their education and getting a good job upon graduation.

International Internet Start-up

When creating an international experience for students, it is important to set realistic goals for the partners who will collaborate in the project. Pike and Selby (1989) in the book, Global Teacher, Global Learner, suggest a teaching format including (a) knowledge objectives, (b) key ideas or content, (c) activity/output, and (d) resources.

Initially, the present researcher's involvement with the international internet experience was due to an effort to seek the assistance of a colleague in Singapore. Professor Steve Lee at Nanyang Technical University, was a family friend of an Iowa State University graduate whose father developed cancer of the nose. At first Mr. Lee and Dr. Bradshaw used e-mail to obtain a needed out-of-print medical book in the United States. Later during a visit to Singapore in 1992, Dr. Bradshaw observed a teaching environment employing stereolithography, which gave rise to the idea that students in the United States could generate 3-D computer- assisted drawing (CAD/AutoCAD) files and send them via Internet to Nanyang Technical University of Singapore (NTU) for the production of solid models. Two factors-personal acquaintance, and knowledge of the Internet's physical facilities and capabilities-enabled the program to start quickly and gain rapid momentum. The professor quickly introduced two .additional faculty members at the NTU to the project. While the

American students were preparing their segment of the project, they were introduced to the Southeast Asian professor.

During the second semester, Singaporean students were introduced to their United States counterparts and to this author. Together they worked toward the Internet transfer of AutoCAD files from Iowa State to NTU where a 3-D model would be produced based on the United States students' drawings, by driving the computer output on a stereolithographic machine (see Figure 2). Thus, this international Internet student experience was first utilized within the present author's teaching environment. Students at both ends of the globe were experiencing what Rambler (1991) cites as guiding principles for global education: (a) the opportunity to learn about and work with individuals who have different ethnic and cultural backgrounds; (b) cross-disciplinary involvement; and (c) the ability of transnational interactions to impact on individuals and society.

Figure 2
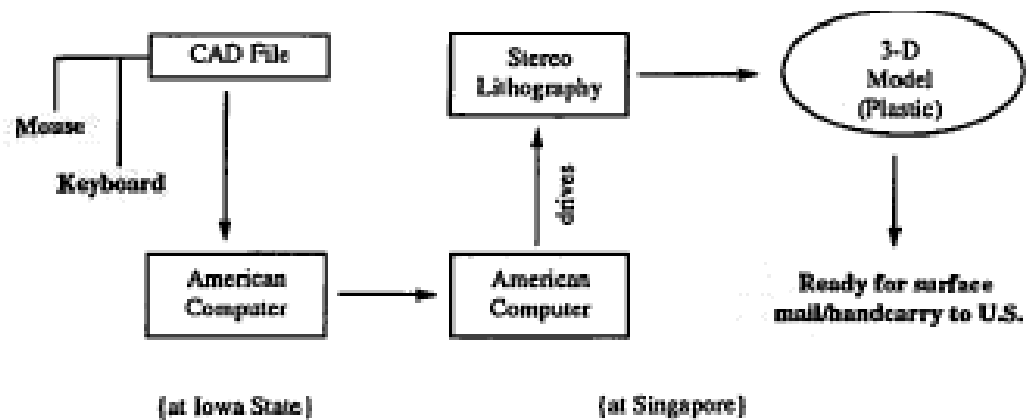
International Internet Student Experience Model

Figure 2: International Internet Student Experience Model

For two semesters, students in two of the author's graphic communication classes utilized the Internet. At the start of each course, class members were surveyed to determine their Internet access and usage. The results were of interest, assuming these classes were representative of other classes at the university (see Table 1). Twenty percent had not previously registered for an Internet account while 20 percent were registered but could not log in to the Internet because they had forgotten their passwords. A third twenty percent used the Internet approximately once per month, usually to send or receive e-mail from a friend at another university. Another 20 percent had developed reasonable facility using the Internet, having been shown or having learned through personal browsing. The final 20 percent were major users of at least one or more of the Internet services.

Table 1
Use of Internet

Use	Percentage
Were not registered for an account	20
Were registered but could not login	20
Used Internet approximately once a month	20
Had moderate facility using Internet	20
Were Major users Total	20
Total	100

Traveling Along the Internet Highway

A decision was made to view the Internet as an information gathering/disseminating tool. A major problem appeared to be the user's ability to understand the range of services provided through the Internet to accomplish information transfers. Following is a brief list of some available information transfer services.

1. Sending and receiving information from distant locations (Glister 1994);
2. Conducting searches, such as for location of topics, names, dates, even photographs;
3. Locating, sending and receiving files (Glister 1994);
4. Transferring information via the "chat" or "talk" mode. This method of information transfer differs in that the parties involved can interact with their information in "real time" with feedback via the keyboard and computer monitor (Glister 1994, *Online Access* 1994; *Internet World* 1994, Pioch 1993);
5. Using "bulletin boards". Bulletin boards are topic specific so per- sons posting and receiving information can easily locate the appropriate bulletin board (Glister 1994; Hahn, Harley and Stout 1994).

Assisting New Users to Become Frequent Users

It has been problematic getting the non-user introduced to the Internet. The following methodology has been devised to assist the uninitiated as well as to expand the capabilities of those currently using the Internet. A user-friendly manual was developed by the author (Bradshaw 1995) which focuses on local protocol to gain access to various Internet information services:

1. Methods to obtain e-mail addresses of persons who might have information you desire or who might need your information;
2. Usernet news services (bulletin boards), chat, and FTP (file transfer protocol) for downloading and uploading files;
3. Getting "on line".

The Student Assignment

The academic assignment was for each student to either deliver technical content, find information on updated technology, or participate in a conversation about the technology being employed in printing for manufacturing. This was to be carried out via the Internet. Double credit was offered for those completing the assignment internationally by obtaining the e-mail address of an international person and then conducting a mini- mum of two electronic exchanges between themselves and a minimum of two people, either by e-mail or Internet relay chat.

Finding Internet Users Interested in Project Participation

Dr. Bradshaw knew the difficulty of finding e-mail addresses. During the semester break of December 1994/January l995, he spent numerous hours on the Internet finding students who were initially from Australia, Singapore, Israel, Finland, and Taiwan, and who were excited about the possibility of communicating with the American students via the Internet. This portion of the project is still on-going. The American students had great difficulty in finding their own initial contacts. One technique employed was to have the student work alongside the professor to observe how to strike up a conversation with unknown people.

The most efficient means of obtaining e-mail addresses was the Internet Relay Chat (IRC) service. This technology allowed the ability to communicate in "real time". It also allowed for private conversation so communication could be carried out accurately and gave a means for insuring e-mail addresses were correct. All contacts made were with university students, however, none of these contacts had coursework that correlated to those of the Industrial Technology students involved in the study. Discussions usually centered on the cost of products, food, and personal interests. The exchange of general information about each other's school, curriculum and academic calendar were also common topics.

Accountability

In addition to the *Beginter* manual (Bradshaw 1995) available for the Internet, there was a need to hold the students accountable for getting "on line". This was accomplished by sending the course syllabus via e-mail. Students were also encouraged to let the instructor know via e-mail when they received the document and if they had any questions pertaining to its contents.

At the start of the author's graphic communication class, a demonstration was given on the most elementary rudiments of sending and receiving an e-mail message, getting into IRC (Internet relay chat) to chat, subscribing to a bulletin board and reading its listings. The common thread of the demonstrations was how to obtain e-mail addresses for those who desire information or how to receive information that is desired.

While several projects in the syllabus were designed to introduce students to a number of different Internet services, often students got "hooked" as users. In one class assignment,

students were required to pursue any one topic via e-mail with another user from another country. The topic source was obtained from the course outline acquired via e-mail. To complete the assignment, any of the Internet services could be used singularly or together, but documentation of success via printout was required.

Project Data Collection

Data collection for formative evaluation during the international Internet experience was made through class observation and class records. As depicted in Table 1, the initial observation was that the class spanned the extremes of 20 percent Internet users and 20 percent without access to Internet. By midterm the class had 100 percent users, and by the end of the semester, the new users were approaching the proficiency of the initial users. Each student was interacting via the various Internet services.

Student Comments Evaluating Internet Services

Throughout the program, students freely shared their opinions about the Internet services. A major benefit of the program was that students noted they became more focused in their use of searches. Following are selected comments:

1. Chat - The most enjoyable service. A nice feature of Chat is instant feedback confirming receipt of a message. The IRC is time-consuming yet addicting, and it is one of the most efficient means to obtain an e-mail address when a planned, focused strategy is employed.
2. Usenet News - A relatively efficient means of finding postings of interest for industrial technology topics. If a desired topic was found, an e-mail address always accompanied it. Usenet News allows for posting/reading and then the opportunity to follow up, however students have experienced that some posters do not respond to their e-mail.
3. E-mail - A communication system dependent upon use by users. An efficient means of communication, but only if the receiver receives the message and responds in an acceptable time frame. Some messages were never acknowledged.

A major shortfall of the entire system was that, currently, there is no means to verify that the "expert" at the other end is truly an expert, or is the identified person.

Conclusion

The Iowa students participating in the international Internet experience learned how to access the Internet and they became aware of the value of the speed at which knowledge can be obtained. These students were seeking information about studying and traveling abroad. The majority of the students felt they were ready for the challenge to assist their future employers to gain entry and travel the Internet highway. Instead of being limited by local perspectives, these Internet users felt they were becoming better members of the global community.

Benefits

As a result of the international Internet experience, students gained interaction with persons from Finland, Israel, Singapore, Taiwan, Australia, the United Kingdom, Cyprus, Turkey, and Greece. They also gained a better understanding of the world, realizing that not everyone gets excited about basketball and football, and, in most parts of the world, football refers to soccer. Students found that concepts such as occupational safety and the United States Occupational Safety and Health Association (OSHA) standards were difficult to communicate. On a more personal basis, students found that, although foods are different and the weather may also be different, the warmth of family love was the same throughout the world. The students also found that the students in other countries were just as curious about Americans. Both discovered they had the same questions in their minds about people from other cultures as people from other cultures have about theirs.

The benefits of any program can often be seen in the success of the participants. In this particular instance, the international Internet experience at Iowa State University opened an exciting door to an international career for one of the industrial technology undergraduates who participated in the program. Following the completion of the B.S. degree program, this student was offered a position in Italy with an electronics manufacturer that uses graphic communication in its processes. *As* a new employee, the graduate was sent to Japan for two weeks of job training and has enjoyed a successful position in middle management during the first year on-the-job. In a recent e-mail to Dr. Bradshaw, the former student reminisced about the personal growth gained from the international student experience while at Iowa State. Having had no prior experience with the Internet or international students before participating in the program, this graduate is now in the position to offer a job within the company to a second industrial technology graduate who has also demonstrated similar abilities.

Recommendations for Future Use

Throughout the international Internet student experience, American students received many requests from students in other cultures to help them get their friends involved in a similar venture. International students were also interested in obtaining first-hand knowledge leading to possible study in the United States. Educational experiences such as this could and should be encouraged among several nations. The increased availability and ease of Internet communication offers students from all parts of the globe a unique opportunity to extend their education beyond the boundaries of traditional university settings, to experience first-hand the coming together of the global community.

Knowing how to transfer files on the Internet, understanding Network capabilities and limitations, and knowing where to seek assistance when the system fails are skills students develop when they experience the Internet's usefulness. The keys to internationalizing the Internet to provide educational experiences for faculty and students are capability and time. Successful navigation on the Internet highway to provide inter- national

Internet educational experiences among students and/or faculty cannot be achieved unless persons at both ends of the Internet are capable and have the time to focus on such a collaborative undertaking.

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About the Author

Dr. Larry L. Bradshaw was an Iowa State University faculty advisor the Singapore Student Association since 1982. He developed and led a group of ISU students to LSY Color Scanning in Seoul, Korea for a co-op experience in 1987. He was a Fulbright scholar on the island of Cyprus in 1991. He received his bachelors and masters from the University of Northern Iowa, Cedar Falls. He taught in the Cedar Rapids Schools for 14 years before beginning his teaching career for 25 years at Iowa State University in Ames, Iowa, where he received his PhD in Industrial Education & Technology. He received the G. Harold Silvus graduate student award and later received the Epsilon Pi Tau Laureate Award. He was a member of the Epsilon Pi Tau and the Phi Beta Delta Honor Society for International Scholars. He spent a summer with the USAID Teach Corp in Kathmandu, Nepal. With his family, he spent a year in Papua New Guinea under the Summer Institute of Linguistics. He was a delegate under Lt. Governor Anderson's Trade Mission to Korea and the following year took Iowa States students to Korea on a work-study program. Dr. Bradshaw was deceased on January 15, 2013.