Training Teachers for the Twenty-First Century:
The Chilean Institute for Technology Enhanced Teaching and Learning

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The 2001 Fall Institute for Technology Enhanced Teaching and Learning was held on the Penn State University Park Campus and consisted of a six-week program of study from September 30 to November 9. The Division of Continuing Education, in collaboration with the College of Education at Penn State University, the Consorcio Red de Educación a Distancia, (CREAD) and with support from the Office of International Programs, offered the six-week non-credit Technology Institute for twenty-one Chilean primary teachers as part of a grant from the Chilean Ministry of Education.

The Institute serves as an innovative model for international outreach, providing an example of how Continuing educators can forge partnerships to offer programming in a bilingual format. In a paper prepared during the Institute, a National Supervisor of the Chilean Ministry of Education and group coordinator, wrote, "I feel that Chile has extended its borders. The barriers have disappeared, and we are all united for the same flag – education. Educate everybody!"

Identified Goals and Objectives

The primary goal of the Institute was to afford educators an opportunity to explore the improvement of competencies and the development of technological skills required by the educator's role in today's world.

A major emphasis of the Institute was to better prepare Chilean primary teachers to develop and teach meaningful and thoughtful, web-based integrated curriculum units in science, social studies, arts, and humanities. A second emphasis of the Institute was to prepare teachers to have a positive impact in their home country by spreading the knowledge acquired in the Institute. The Institute provided an educational program anchored in pedagogical principles and practices, instructional design concepts, including the development of on-line course content, the appropriate use of multimedia and graphics in on-line instructional content delivery, and methods for improving student interaction in an on-line learning environment.

The objectives of the Institute were designed to help participants achieve the overall goals of the Institute as well as to develop areas of individual expertise. More specifically, the program objectives were: (1) to provide primary teachers with an update on current trends, issues, curriculum, and methodology in education related to the use of technology; (2) to improve technology competencies based on individual measurements of strengths and needs; (3) to extend the capacity of teachers to integrate technology into their curriculum by providing resources and hands-on training in the construction of web sites, use of multimedia applications, and word processing; and (4) to develop and implement web-based thematic content units that emphasize

connections among disciplines in science, social science, arts, and humanities. The final three objectives included the development of web-based activities and lessons that will help children construct their own knowledge by teaching higher-level critical and creative thinking skills; next, to provide teachers an opportunity to develop an understanding of how to integrate and assess the use of technology for teaching and learning in the elementary school; and finally, to improve participants' skills in leadership for planning and implementing institutional reform.

Participant Profiles

The Institute provided an opportunity for the faculty and staff of a large university and small group of Chilean teachers to meet as colleagues and exchange information, learn new teaching ideas, and to develop a global perspective. The level of interaction between the participants, the University, and community participants was productive for everyone. Below is a summary of the characteristics of the participants.

Gender	No.
Women	13
Men	8
Average Age	43
Min Age	29
Max Age	55
Median Age	45

The faculty for the Institute were regionally, nationally, and internationally recognized experts in their fields of research and education. They have published extensively on various aspects of educational pedagogy, international and global collaboration, and technology and distance education learning.

Project Evaluation

Evaluation was conducted on the outcomes of the Institute as well as the conditions or antecedents that described participants, instructors, and resources for learning. The following instruments were developed and administered to measure the accomplishments of the Institute as accurately and objectively as possible:

1. Participant Profile Questionnaire
2. Pretest and Posttest Skills Assessment
3. Institute Evaluation Form
4. Journal Reflections
5. Participant and Faculty Interviews

Data gathered from the participant profile questionnaire, pre/post test skills assessment, Institute evaluation form, journal reflections, and in-depth interviews, are summarized in this article.

Results of the Evaluation

Paired t-tests were used to assess whether there was a statistically significant increase in the mean number and percentage of a participant's skills within each of the five major skill areas (Ott, 1984). In addition, mean gains and a participant's ratings of their proficiency level within each of the five skill areas were compared across skill areas using paired t-tests. Specifically, the difference between the pretest and posttest in the percentage of skills participants could do was compared across skill areas. Also, a participant's mean proficiency ratings within each skill area (for those participants who indicated that they could do the skill on the posttest) were compared across skill areas using paired t-tests. In addition, the Pearson correlation coefficient was used to determine whether gains in one skill area were related to gains in other skill areas (Ott, 1984).

Participants completed a program evaluation form at the end of the workshop. Participants rated the extent to which they agreed or disagreed with the statements about various aspects of the workshop using a '1' to '5' scale, with '1' indicating *strongly disagree* and '5' indicting *strongly agree*. Descriptive statistics were obtained for these questions and responses on the evaluation form were correlated with scores from the posttest using the Pearson correlation coefficient.

Results of the Pretest and Posttest Assessment of Skills

Results indicate that participants showed a statistically significant improvement in all but 4 of the 50 skill areas (p<.05). The reason that there was not a statistically significant improvement in 4 of the 50 skill areas is that nearly all of the participants could already do the skill on the pretest: three of these skills related to word processing (open, save, and print an existing document) and one related to general computer operations (save a file on the computer's hard drive and on diskettes). In addition, it was not possible to assess the significance of four questions under the general computer operations skill area due to lack of variability – 100% of the participants indicated *"yes"* on the pretest and posttest.

The number of skills participants could do on the pretest and posttest within each skill area were compared using paired t-tests. Gains were statistically significant in all skill areas (p<0.001). Figures 1a though 1e illustrate the improvement in participants' skills within each area over the course of the workshop.

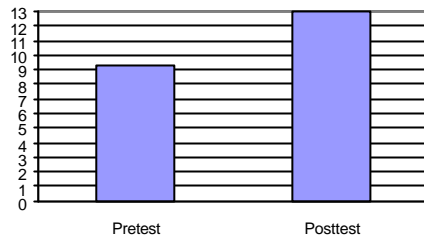**Figure 1a: Mean Number of General Computer Operations Skills**
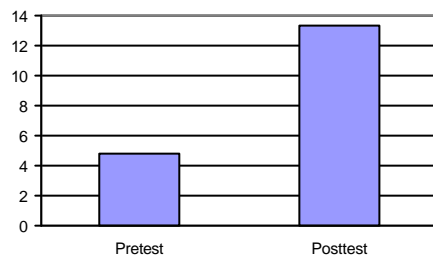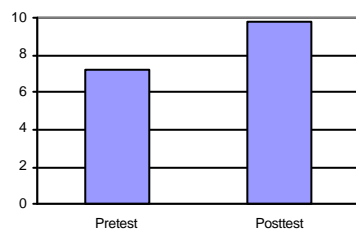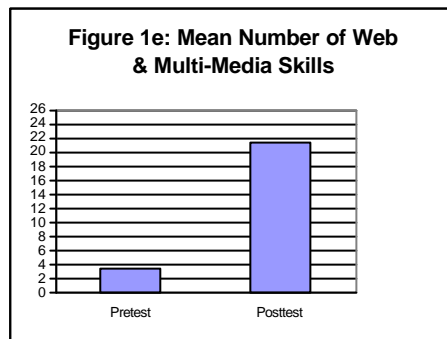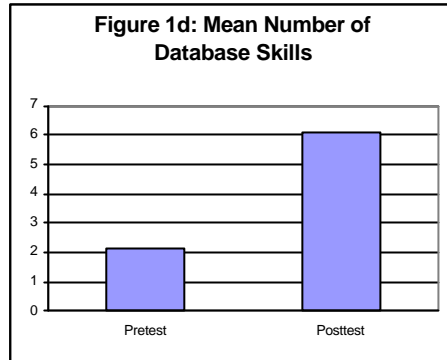

Figure 1b: Mean Number of Internet Knowledge Skills

Figure 1c: Mean Number of Word Processing Skills

Figure 1d: Mean Number of Database Skills

Figure 1e: Mean Number of Web & Multi-Media Skills

These results indicate that by the end of the workshop, participants were more skilled in general computer operations in particular, and to a lesser extent in word processing compared to the other skill areas. Participants were weakest in database and web and multimedia skills.

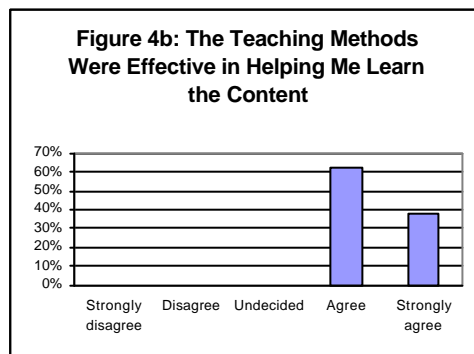**Figure 2: Mean Percent Correct on Pretest and Posttest**
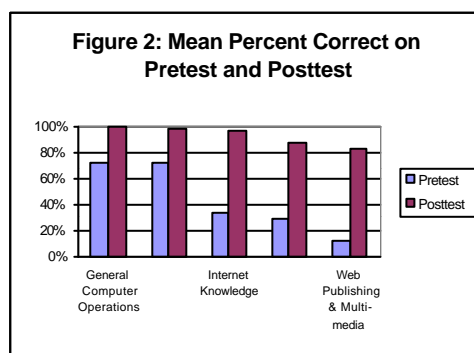
In order to determine whether gains in one skill area were associated with gains in another skill area, the Pearson correlation coefficient was calculated. Results indicate that gains in general computer operations, internet knowledge, and word processing were significantly and positively correlated (general computer operations & internet knowledge: $r=0.765$; $p<.001$; general computer operations & word processing: $r=0.792$; $r=0.761$; $p<.001$). In other words,

participants who showed larger gains in general computer operations also tended to show larger gains in internet knowledge and word processing. Conversely, participants who showed smaller gains in general computer operations also tended to show smaller gains in internet knowledge and word processing. Gains in the other skill areas were not significantly correlated ($p > 0.05$).

Presenters, Topics, and Content

Participants rated various aspects of the workshop at its completion using a program evaluation form. The tables below depict the extent to which participants agreed or disagreed with the evaluation statements.

Figure 4a: Overall, Very Satisfied w/ Quality of Educational Experience

Strongly disagree	Disagree	Undecided	Agree	Strongly agree
0%	0%	0%	~43%	~57%

Figure 4b: The Teaching Methods Were Effective in Helping Me Learn the Content

Strongly disagree	Disagree	Undecided	Agree	Strongly agree
0%	0%	0%	~62%	~38%
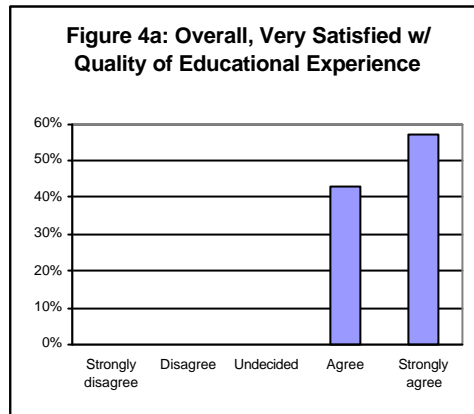
The overall evaluation measures collected from the Institute Evaluation indicate that the participants strongly agree that the Institute was a significant and valuable educational experience.

Conclusions and Recommendations

A major goal of this Institute was to provide technology training for international teachers. Clearly this goal has been met. Participants appeared eager to engage in substantive web creation and lesson plan construction around a variety of multidisciplinary themes. Significantly 100% of the participants responding to a written program evaluation questionnaire indicated that they were very satisfied with the program.

The three objectives of the Institute have also been successfully achieved. As seen in the evaluation data, the broad scope of the Institute and the significant time period of six weeks allowed participants an opportunity to develop skills and explore new directions for their own teaching. A basic premise for the Institute is that the participants will build upon each other's strengths to accomplish their individual project goals. The CD-ROM and web pages developed by the participants reflect this expectation.

The link between process and outcomes of the Institute was a fundamental strength in the program. Much discussion with the project partners centered around how the program processes (activities, topics, organization, scope, delivery, etc.) successfully led to specific program impacts. The informal observations, discussions, interviews and pretest and posttest assessment results seem to indicate that the nature of the participant experience within the Institute clearly reflects the nature of the program objectives and has led to valuable program impacts. It is clear that all participants, faculty, and staff achieved a broader understanding of the culture of Chile and the United States as a result of the project. Comments from the participants indicated that the Institute helped provide significant insights into the use of technology in their own teaching practice. While program products (web pages and CD-ROMs) tended to be more individualized according to each participant's interest, there were some significant common understandings woven through the Institute.

First, participants felt that the interaction between the cultures of the United States and Chile was an important contribution of the Institute. Diversity in opinions, international perspectives and the interdisciplinary focus provided the context for a wide possibility of social and academic interactions around the use of technology. Secondly, it is the hope that these interactions will provide valuable insights into future educational directions for both countries. Recommendations to promote further sharing of research and experience in the integration of technology into teaching include: (1) the continued support of a technological link between the two countries, and (2) the generation of funding to be used for future institutes.

The integration of technology into teaching and learning continues to be increasingly important worldwide. To meet the evolving challenges of technology integration in the Western Hemisphere, increased sharing of knowledge among countries is crucial. The contribution of the Institute for Technology Enhanced Teaching and Learning toward the vision of international cooperation in this endeavor is far-reaching. The 2001 Institute and the Penn State University's Division of Continuing Education, CREAD, College of Education, and University Office of International Programs have helped faculty, staff, teachers, and students from diverse cultures to continue to build upon their understanding of the global impact of technology in enhancing teaching and learning.

References

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