Teacher Training and the Effect of Past Experience on Preservice Teachers' Concerns for the Role of the Internet in Planning and Instruction

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There appears to be little doubt that electronic communications of all kinds (electronic mail, file transfers via communications, and direct talk modes via networked computers) will become increasingly important in the future. Russett (1994) reports that telecommunications provide a quick, efficient, and dependable source of information for more than 20 million people, and the Internet provides opportunity for businesses and private participants to communicate, store, and recall information with greater ease. Pool (1993) describes the Internet as an electronic network that connects colleges and universities to the world's largest and most complex library of approximately 50 thousand databases. Most educators recognize the value of this source of information and communication in the field of teaching; however, few teachers have the skills necessary to use the new technology (Werner, 1994).

School districts, realizing the power of the Internet as an information tool to improve communications and research, grappled with the problem of training teachers to use the new technology. Honey and Henriquez (1993) reported the results of a national survey designed to obtain a systematic profile of activities currently being undertaken by K-12 educators in telecommunications. Responses of 550 educators from 48 states who were a specialized group of experienced teachers

and were knowledgeable about computer technology indicated that telecommunications served as a valuable resource in teaching. Respondents reported that computer and library media specialists were usually the leaders in telecommunications practices, serving as a resource for other teachers. Most respondents were self-taught, and their responses emphasized the lack of telecommunications training available in the schools for practicing teachers.

Universities also struggled with questions about the appropriate semester and best approach for introducing telecommunications training to their preservice teachers. It was generally accepted that most college students had some background experience with computers; however, students with technology anxiety often became very skillful at avoiding assignments requiring these skills. While the Internet can be used as both a communications and a research tool, most of the articles published since 1992 were descriptive, alerting educators to problems to be avoided in developing instruction and reporting use of the Internet to improve communications among professors, cooperating teachers and college students. Russett (1994) stated that "it is not difficult to find information describing how enterprising teachers use telecommunications in their classrooms; however, it is very difficult to find studies describing how teacher education institutions can (or should) employ telecommunications" (p. 4). When or how should this instruction take place? Who should provide the training? Should valuable time be provided in education courses or should students be required to take workshops in computer labs? Could assignments of short duration be expected to show positive results? What could we learn about the instructional process that would assist teacher education programs in their efforts to provide effective technology training? All of these questions are debated by teacher educators.

To address these issues, more information is needed to determine the backgrounds of individuals enrolled in teacher education programs. Also needed are strategies that can stimulate interest in computer research and build students' confidence in using technology. This paper reports the results of an explanatory training and guided practice instructional plan developed at our institution.

Method

Participants

The participants who completed the survey were 53 sophomore elementary education majors enrolled in two sections of a foundations of reading course. Our goal was to determine if Internet instruction and

guided practice could effect a change in the concerns students had toward the value of technology in planning for instruction,researching information, professional development, and cross curricular planning. *The Stages of Concern Toward Innovation* (George, Hall, & Rutherford, 1977) instrument was used as a pre- and postmeasure of concern toward technology. In this instance, the innovation referred to by George et al. was identified by the authors as the use of Internet (see Appendix). Instruction surveys were administered at the beginning of the spring semester 1996. Posttreatment surveys were administered at the close of the semester, following instruction and completion of the tasks. Reed (1990) describes the rationale for the stages of concern instrument by stating:

> When people are exposed initially to an innovation, their concerns tend to be very self-oriented . . . Once these concerns are accommodated, they become more concerned about managing the innovation in their teaching, how the innovation will affect their students, how they might work with others in relation to the innovation, and when best to use the innovation. (p. 7)

The *Stages of Concern* instrument includes seven stages identified by George et al. (1997).

- First Stage is Awareness: I am not concerned about the Internet.
- Second Stage is Informational: I would like to know more about the Internet.
- Third Stage is Personal: How will using the Internet affect me?
- Fourth Stage is Management: I seem to be spending all of my time getting material ready when using the Internet.
- Fifth Stage is Consequence: How is my use of the Internet affecting my students?
- Sixth Stage is Collaboration: I am concerned about relating my use of the Internet with what other instructors are doing with it.
- Seventh Stage is Refocusing: I have some ideas about how something might work better.

Students were divided into three groups based on their initial responses to the following statements on the *Stages of Concern* instrument.

Statement 3: I don't even know what the Internet is,

Statement 6: I have very limited knowledge about the Internet, and

Statement 30: At this time, I am not interested in learning about the Internet.

Group 1 (n=8), prior experience, responded with "not true of me now." Group 2 (n=24), limited prior experience, responded with "somewhat true of me now." Group 3 (n=21),no prior experience, responded with "very true of me now." The finding that only 15% of the sophomores had prior experience, 45% had limited prior experience, and 40% had no experience indicated that most young adults in our classes were not exposed to technology in their homes or school settings, and they had not reached a comfort level that prevailed over anxiety about practical application. Therefore, we decided to provide the same training to all three groups of students and compare their levels of concern using a paired t-test design.

Training

All students received a 1-hour orientation to the Internet, during a regularly scheduled class period. Instruction was led by a library media specialist in the computer lab where students were paired at terminals. We observed that students' familiarity with computers varied from none at all to the experienced user. Instruction in navigating the Internet and finding information using the World Wide Web included:

- a definition of the World Wide Web
- logging on to the computer system
- accessing Internet
- navigating Internet via various web browsers
    - Lynx
    - www
    - Mosaic

  - MacWeb
  - NetScape
- explanation of a URL
- where to find the subject catalog of the Web
- names and focuses of automatic indexes (search engines) such as Yahoo, Lycos, WebCrawler, etc.

Guided Practice

Following the orientation, students worked with a partner to complete two tasks requiring use of the Internet. Task #1 required locating a web site dedicated to a special interest (e.g., music, Civil War, astronomy, photography, fishing, gardening, sports). The sophomores were to use this information to design a lesson that would integrate literacy skills. Task #2 required sophomores to develop an annotated bibliography of five web sites that would be useful to them as a teacher. These sites could include lesson plans, book lists, or articles to further their professional development.

Findings

At the completion of the semester, the *Stages of Concern* instrument was readministered to determine the differences in levels of concern between and among the three groups. These data were also inspected to form a hypothesis about how the training may have affected the levels of concern for each group: prior experience, limited prior experience, and no prior experience. Table 1 shows the changes in levels of concern for each group by way of pre- and posttest means. Changes, as determined by the paired *t*-test, are printed in bold type.

To interpret these scores, we used stages of concern outlined in this paper. These concerns about an innovation can be traced through four phases. The first phase is one of self-orientation, what does the use of this innovation do for me. The second phase is a concern for managing the innovation if used for instructional purposes. An understanding of the basic rudiments and limited practical application of the innovation have been understood at this phase, but a comfort level for incorporating the innovation into curriculum planning still poses a concern. The third phase focused on how the innovation will affect students. This is a departure from self-orientation to a concern for others. It is a notable transition and a harbinger of effective integration of the innovation into instruction. The fourth phase relates to working with peers in the use

Table 1

Stages of Concern Toward Innovation Pre and Posttest Means

Stages of Concern	Prior Experience Group 1 Pre-Test Means	Prior Experience Group 1 Post-Test Means	Prior Experience Group 1 *T-score*	Limited Prior Experience Group 2 Post-Test Means	Limited Prior Experience Group 2 Pre-Test Means	Limited Prior Experience Group 2 *T-score*	No Prior Experience Group 3 Pre-Test Means	No Prior Experience Group 3 Post-Test Means	No Prior Experience Group 3 *T-score*
Awareness	35.9	38.7	0.318	53.0	49.0	-.318	67.8	49.0	-5.018**
Informational	80.3	83.6	0.334	92.4	88.3	-3.250*	96.7	94.7	-5.383**
Personal	81.8	85.4	0.378	88.8	92.0	.239	90.6	89.4	-0.200
Management	52.4	60.8	0.63	66.5	78.4	.959	83.6	80.7	-1.997*
Consequence	49.8	65.8	5.526**	55.5	63.5	.236	44.9	56.6	5.194**
Collaboration	57.8	73.1	1.287	60.2	65.1	1.610	57.2	54.7	1.794
Refocusing	76.0	82.3	2.301	77.8	82.0	.682	64.6	77.9	4.320**

* Significant at .05 to .003

** Significant at .001 to .0003

of the innovation and looking for additional or alternative ways to use the innovation to achieve effective teaching. This phase clearly separates self-oriented concerns from other oriented concerns that encourage experimentation and peer interaction.

As shown in Table 1, posttest scores of participants with prior experience (Group 1) revealed an increase in all stages of concern, most notably an increase in the area of Consequence. This departure from self-oriented concerns indicates that this group had all but left behind any preoccupation with anxieties about learning the basics of accessing and applying information available on the Internet to their teaching practice.

Posttest scores of participants with limited prior experience (Group 2) revealed a decrease in the area of Informational concerns. These students appeared to have reached a level of satisfaction regarding their knowledge base as Internet users. We think this speaks to the effectiveness of the training and the appropriate focus of the tasks. Both were tailored to show direct application of the Internet to teaching and were directly related to course expectations.

Posttest scores of participants with no prior experience (Group 3) also are related to the effectiveness of the instruction, the appropriateness of the tasks, as well as effects of guided practice on lowering levels of concern and anxiety. Differences were shown in the areas of Awareness, Information, Management, Consequence, andRefocusing. Though we expected a reduction in students' levels of concern, we were not expecting such sweeping changes for this group in areas unrelated to self, specifically, Consequence and Refocusing. This might be explained as a ride on the wave of success. The instruction was well paced, the tasks were guided and specific to planning and instruction, and working with a partner provided a safety net. Prospective teachers often exhibit an enthusiasm to effect change in the world of teaching, and this group may have reevaluated the Internet as a tool for planning and teaching. Moreover the change in their concerns about Refocusing indicates they developed ideas about using the Internet in their teaching in new and different ways.

Discussion

Teacher education programs and public schooling are entering an electronic age where the Internet will become increasingly more important as a communication and information gathering tool. We were surprised to discover in our literature search that most recent publica-

tions discussed using the Internet for communications purposes, but little research was reported about strategies to train preservice teachers in the use of technology. We felt it was important to find out about the backgrounds of our studentsto determine if instruction of short duration could affect changes in their learning behaviors and attitudes about using technology.

One would assume that in this age of technology many students in university classrooms have used computers in their school and home settings and would already have some familiarity with the Internet. This was not true for our students. However, even those students who initially experienced computer anxiety became skillful when placed in a situation that required computer use. When planning future Internet training, we need to address the wide range of differences among students' knowledge about and past experiences with using technology.

Class time and student contact hours are very limited, and some university instructors could be reluctant to use valuable time for computer training. We felt, however, that students would be more motivated to experiment with technology if training was directly attached to a class project. We found that short term training that involved guided practice resulted in positive changes in our students' learning behaviors and attitudes about technology.

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Appendix

Attitudes Toward Using The Internet

Directions: Answer as completely and truthfully as you possibly can when thinking how each of the following statement applies to your PRESENT attitude toward using the Internet. Circle the number that best reflects your present attitude. The higher the number, the better the statement reflects your present attitude.

0 1 2 — Not true of me now; 3 4 5 — Somewhat true of me now; 6 7 — Very true of me now

0 1 2 3 4 5 6 7	1. I am concerned about people's attitudes toward using the Internet.
0 1 2 3 4 5 6 7	2. I now know of several approaches for how I might go about using the Internet.
0 1 2 3 4 5 6 7	3. I don't even know what the Internet is.
0 1 2 3 4 5 6 7	time to learn about the Internet so that I can use it effectively.
0 1 2 3 4 5 6 7	5. I would like to help other people use the Internet.
0 1 2 3 4 5 6 7	6. I have very limited knowledge about the Internet.
0 1 2 3 4 5 6 7	7. I would like to know how the Internet might affect me when I am trying to teach.
0 1 2 3 4 5 6 7	8. I am concerned about what my employer might expect me to know about the Internet and how those expectations might be in conflict with what I would like to do.
0 1 2 3 4 5 6 7	9. I am concerned about improving what I presently know about the Internet.
0 1 2 3 4 5 6 7	10. I would like to work with potential or present co-workers who are using the Internet.
0 1 2 3 4 5 6 7	11. I am concerned about how the Internet might affect my students.
0 1 2 3 4 5 6 7	12. I am not concerned about the Internet.
0 1 2 3 4 5 6 7	13. I would like to know who will make decisions about my using the Internet.

0 1 2 3 4 5 6 7	14. I would like to discuss the possibility of using the Internet.
0 1 2 3 4 5 6 7	15. I would like to know what resources are available if the Internet is to be integral to my job.
0 1 2 3 4 5 6 7	16. I am concerned about my inability to learn all there is to know about using the Internet effectively.
0 1 2 3 4 5 6 7	17. I would like to know how my job is supposed to change because of the Internet.
0 1 2 3 4 5 6 7	18. I would like to familiarize my co-workers and my employees with the Internet as I learn about it and work with it more.
0 1 2 3 4 5 6 7	19. I am concerned about how the Internet might affect my students.
0 1 2 3 4 5 6 7	20. I would like to be able to change how the Internet might be used as I learn more.
0 1 2 3 4 5 6 7	21. I do not care much about the Internet because my schedule prevents me from doing so.
0 1 2 3 4 5 6 7	22. I would like to modify the use of the Internet based on the experiences of my students.
0 1 2 3 4 5 6 7	23. Although I don't care much about the Internet, I am concerned about it.
0 1 2 3 4 5 6 7	24. I would like to excite my students about the uses of the Internet.
0 1 2 3 4 5 6 7	25. I am concerned about the time needed to learn about the Internet that will keep me away from doing what I am supposed to be doing as part of my job.
0 1 2 3 4 5 6 7	26. I would like to know what using the Internet will require in the immediate future.
0 1 2 3 4 5 6 7	27. I would like to coordinate my efforts in learning about the Internet with co-workers.
0 1 2 3 4 5 6 7	28. I would like to have more information on the time and energy required in order to learn about the Internet.
0 1 2 3 4 5 6 7	29. I would like to know what other people are doing in relation to using the Internet.
0 1 2 3 4 5 6 7	30. At this time, I am not interested in learning about the Internet.
0 1 2 3 4 5 6 7	31. I would like to determine how to supplement and enhance the use of the Internet.
0 1 2 3 4 5 6 7	32. I would like to use feedback from my students to change the use of the Internet.

0 1 2 3 4 5 6 7 33. I would like to know how my job will change when I am using the Internet.

0 1 2 3 4 5 6 7 34. My present schedule is preventing me from learning too much about using the Internet.

0 1 2 3 4 5 6 7 35. I would like to know how using the Internet is better than the methods I presently plan to employ when I do my job.