CHAPTER VII
SUMMARY AND CONCLUSIONS

Summary of Findings

The purpose of this study was to present a model for researching the effectiveness and cost-effectiveness of distributed online adult training programs. The model consists of three elements: 1) a framework for describing the technology and instructional design; 2) the research design and internal and external validity control methods; and 3) the cost-effective analysis for alternative delivery methods. This media-comparison model was applied to a study of First Connections, a distributed online adult training program for early childhood care providers. There were four research questions:

1. Can the validity of a media-comparison study be established using an updated media-comparison model?

2. Are there significant differences in posttest scores among the conventional classroom group, the experimental non-credit group, and the experimental college credit group?

3. How do participants rate the content and presentation of First Connections and what is their reaction to using a distributed online adult training program?

4. Are there differences in cost-effectiveness between the conventional courses and distributed online adult training program?
Explanations of Findings

Results of the study indicate that there was no significant difference among the groups ($F(2, 59) = 2.580, p = 0.084, \text{partial } \eta^2 = 0.080$). Research results indicated a violation in the assumption of the homogeneity of slopes, and violations of the homogeneity of variances between groups. These problems are not unusual for quasi-experimental research designs in which population sampling is not random.

The media-comparison model of research presented in chapter III increases the breadth of information available to researchers and consumers of research by reporting the effect size and the confidence intervals along with the results of the null hypothesis significance testing (NHST).

Participants Ratings and Reaction

Participants generally rated the content and presentation acceptable, with a mean of 3.98 and 3.73 on a five-point scale. The reaction to the content was also acceptable, with a mean score of 4.05. There were no significant differences found between groups in the ratings of the three variables: content, $t(39) = .050, p = .961$; presentation, $t(39) = -.134, p = .894$; and reaction variable, $t(41) = 1.396, p = .170$. 
Cost-Effectiveness

In comparing the conventional classroom and online for credit groups, the data indicate that the online group had a lower CE ratio. The findings indicate that First Connections is a viable, cost-effective alternative to the conventional classroom. Its cost-effectiveness can be improved with additional enrollment in the online version. It is estimated that the CE ratio could be made 80% more effective with an enrollment of 200 students, 100 credit and 100 non-credit. A CE ratio under $100 per student may be achieved with enrollments of 600 students or more.

Significance of Findings

In some instances, program objectives transcend statistical significance and cost comparisons. First Connections was an effort to increase the continuity of care among individual providers. Additionally, First Connections endeavored to increase the quality of care for infants and toddlers while increasing the feeling of professionalism among providers.

Results of the study indicate that statistically, there were no differences between groups. Moreover, pretest scores revealed that participants in each group had already obtained the knowledge base for infant and toddler care. Each group scored over 80% on the pretest, leaving very little room for improvement on the posttest. The cost-effectiveness analysis indicated that First Connections may or may not be cost-effective, depending on the cost components considered and the way they are presented. A major threat to the cost-effectiveness of First Connections is the high rate of attrition for the online groups. An attrition rate of over 50% indicates that providers are still
experiencing barriers to training. The rate of attrition affects the overall CE ratios negatively, increasing the costs per student. For example, had 50% more of the participants completed the study for the non-credit group (N = 20), the CE ratio would have decreased by 30%, roughly a 4.3% decrease in cost per student. The overall CE ratio would fall from $4,017 to $2,812, which is below the conventional classroom cost of $2,961.

The importance of First Connections is the move toward standardized care in early childhood education. Nebraska has an estimated 5,000 infant and toddler care providers. As of August 2002, over 500 providers -- an estimated 10% of the total population -- had participated to some degree in First Connections. Providers have the opportunity to participate in standardized training, any time and any place, incurring little cost. First Connections delivers current best practices in infant and toddler care to providers traditionally excluded from training.

Clearly, quality of care is an issue, with 63% of childcare in Nebraska found to be “minimal” to “poor” in quality (Edwards et al., 2002). Providers have basic knowledge of childcare, but may be lacking in resources for continuing education. Standardized care may enhance application of base knowledge and may increase the quality of childcare.

Training in early childhood education has been shown to increase the quality levels of care. Edwards et al., (2002) indicate that overall, as education increases, quality of care indicators increase as well. Although these increases in quality are small, any method of training is more effective than no training at all. Continuing education units, in-service hours, and college credit may increase providers’ feeling of professionalism, a stated goal of the program.
First Connections helps to overcome the main barriers that providers indicated prevented them from pursuing additional training. Because the course is offered online, providers can take the course to suit to their own time allotments. Moreover, travel time to educational centers is eliminated, which removes an especially high barrier for geographically dispersed populations in Western Nebraska. Finally, an effective online program that offers continuing education credits (CEUs) and in-service hours should provide the motivation to participate in training. Forty-seven percent of participants planned to share their experiences, motivating others to take part in the program.

**Significance of Model**

A model that reports the statistical results as well as effect size and confidence intervals, and controls for internal and external validity, provides researchers and consumers a high degree of confidence that the results are valid. Results of this type of study may be generalized to larger populations.

**Significance for Researchers**

The body of knowledge surrounding the effectiveness of instructional technology, specifically online distributed training programs, suffers from fragmented research and reporting methods. The model set forth in this study provides a means to present concrete evidence of the effectiveness combined with the cost-effectiveness of online distributed training programs compared to alternative and traditional delivery methods.

**Significance for Stakeholders and Policy Makers**

The goal of First Connections was to improve the quality of care by providing standardized training to all providers. First Connections delivers standardized training to providers anytime and anyplace, clearly meeting the stated goals of the program.
Limitations of Study

The fundamental limitation of this study is the lack of randomization of the sample population. It is unlikely the violations of homogeneity of slopes and variances would have occurred with randomization. The results of no significant difference would have been reversed.

Another limitation of the study was the small sample size and high experimental attrition rate. However, an analysis of attrition indicated that there were no significant differences between those who completed the study and the dropouts.

Technical problems plagued First Connections in the early stages of research. An array of hardware problems and IS support blunders caused the website to be down at critical times during the study, leading to frustration for students and program administrators, as well as for the researcher.

Future Research

Future research following the proposed model could provide a clear understanding of the cost-effectiveness of distributed training programs. Observations of providers in their environment using standardized scales may lead to addition information on the effectiveness of the program. Randomization of groups and larger samples sizes in future studies are needed to determine the effectiveness of distributed training programs.