

The Design and Field Test of a Web-Based Training Program for Future School Administrators in a Northwest Florida School District

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Abstract

A Web-based instructional product was successfully developed and evaluated through a field test. The module was the prototype of a new learning and training system and part of the Florida Principal Certification. The sample consisted of 25 trainees who were teachers, appointed intern assistant principals, or interim principals. The instructor was district-based and served as the subject matter expert. To guide the three phases of the module's production three instructional design models were combined. The statistical analysis revealed the group scored significantly higher on the posttest ($M = 37.56$) than the pretest ($M = 26.88$), $p < .001$. The instructor confirmed all trainees had met identified instructional objectives. Trainees evaluated the Web-based training favorably; the majority of trainees agreed with all 49 items on an evaluation questionnaire administered after the field test. Reported advantages outweighed experienced disadvantages, and participants indicated they would enroll in additional Web-based training modules. Participants offered several suggestions and recommendations for the revision of the module.

Training is expensive for organizations and time consuming for trainers and trainees (Lau, 2000). Traditionally, employees received training either on the job or in classroom settings. Both methods involved face-to-face interaction with an instructor or trainer. With the introduction of computers, employees were able to learn new skills without leaving the workplace (Miller, 1996). The rapid growth of the Internet and the World Wide Web (WWW) made online distance education (DE) possible. Online DE is also called e-learning, Web-based education, or Web-based training (WBT).

The number of courses and certifications offered on the WWW in the business arena has increased dramatically. International Data Corporation, a research company, predicted the market would reach \$11.5 billion in 2003 (Cohen, 2001). More companies are expected to focus on online training in the next few years. Recently, even United States government agencies such as the Commerce Department, the Department of Health and Human Services, the Federal Bureau of Investigation, and the Internal Revenue Service have implemented online DE to save costs and to keep employees up to date (Goodridge, 2001).

Computer technology has entered the educational environment and is here to stay. According to a report by Lewis, Levin, and Greene (1999), the total number of students enrolled in DE courses at postsecondary educational institutions in the U.S. in 1997-98 was 1,661,100. Many universities who did not offer DE courses had planned such initiatives. Twenty percent of postsecondary educational institutions planned to offer DE courses by 2002.

Many staff development opportunities for educators are already online (Goral, 2001). OnlineLearning.net has created a partnership with the University of San Diego due to critical teacher shortage and offers almost 50 teacher certification or professional development courses for educators online (“OnlineLearning.net,” 2000). Another private company that entered this market was WebED, Inc., which offers 15 categories in its K-12 professional development catalog and has six course offerings in its administration category (“WebED, Inc.,” 1999). The National Association of Secondary School Principals (2002), a professional association for assistant principals, principals, and educators who are considering becoming administrators, offers 229 online professional development courses.

There are many advantages of WBT. Some of the benefits for institutions pointed out by Belanger and Jordan (2000) are (a) the use of existing infrastructure to deliver the training, (b) the reach of individuals who would otherwise not be able to participate in the training because of other obligations or scheduling conflicts, and (c) the possibility of future growth of the WBT environment. Cost savings are significant in the Web-based environment. The classroom-based environment is associated with (a) travel time, (b) travel expenses, (c) costs of facilities, (d) materials, (e) office equipment, and (f) support staff (Brown, 2000; Belanger & Jordan, 2000). In a time in which companies are forced to reduce their workforce and cut training budgets in order to stay competitive, many organizations turn to WBT for help. Management executives understand it takes too much time to bring employees and trainers together in the traditional face-to-face environment. The delivery of WBT allows companies to give employees access to exactly the information they need to know when they need to know it (Khirallah & Swanson, 2000).

Advantages to learners include (a) access to some free software on the Internet, (b) more control of their own learning, and (c) up-to-date materials. Many online learners enjoy the convenience and flexibility of learning at any place and at any time. Another possible advantage is increased communication with the trainer and other learners if Internet communication tools are integrated in the training modules (Belanger & Jordan, 2000).

Background

In the past, the selected school district in northwest Florida formed a pool of potential principal candidates, consisting of teachers and appointed intern assistant principals as well as interim principals. Teachers participate in the training program in order to become potential principal candidates. Teachers with master’s degrees in educational leadership were allowed to participate in the training, whereas the training was mandatory for appointed intern assistant principals and interim principals.

The school district decided to change the delivery of its leadership preparation program. Under the old system, the training was conducted with the use of random lectures and site visits during which supervisory administrators checked off items on the training record; the training consisted of 12 sections. Principals or experts in their fields conducted the training in a classroom-based environment. With staff cutbacks, the district experienced difficulties in continuing the training in this manner. The time management of the training became a serious issue for the school district. In an attempt to take advantage of the benefits WBT has to offer, the School Board of this district decided to offer online training for its school administrators.

The purpose of this study was to design a Web-based instructional product for educating and training future school administrators in the district and to evaluate the system through a field

test with participants under realistic conditions. Four research questions directed the inquiry of this study. These research questions were: (a) What is the process of designing and developing a Web-based training and education program for school administrators?; (b) Can learners achieve the stated objectives via WBT?; (c) What are the advantages and disadvantages of implementing the WBT for end users?; and (d) What changes to the Web-based module will be suggested by end users who participate in the field test?

Research Design

The University of West Florida (UWF) was awarded a grant in order to design the WBT for the school district. The participating district provided resources for the development of the new WBT program, identified a subject matter expert (SME), and provided access to the target population. The sample for this study consisted of 25 trainees who had either been appointed to intern assistant principals, interim principals, or teachers who volunteered to participate in the training program. The instructor was district-based school administrator and served as the SME. Initially, the sample consisted of 27 trainees; however, one person realized she had already completed this component of the required training in the classroom-based environment. Only one person did not finish the training after initially returning the pretest and prequestionnaire.

The evaluation of the product had a single group, time-series design. A combination of quantitative and qualitative research methods was employed in the study. The study was conducted in three phases. Phase 1 consisted of the analysis, design and development of a prototype. Phase 2 included the implementation of the instructional product on the Web. During Phase 3, the product was evaluated, revisions were made, and the final module was completed.

The researcher recorded field notes in all three phases. Learners recorded entries in journals pertaining to their experiences; completed two questionnaires, a pretest and posttest, and four assignments; and took part in one semistructured interview. The instructor for the selected module participated in two semistructured interviews, completed a worksheet, and recorded notes in a journal. The quantitative and qualitative data collected over a 13-week period was then analyzed in order to answer the four research questions.

Missing data were substituted with the mean, and the data was examined for univariate outliers. Statistical assumptions were examined in order to avoid their violation. Learner performance and attitude was analyzed and interpreted. Descriptive data and variability measures were generated. A *t* test was performed to determine if differences in scores on the pretest and posttest were statistically significant. Qualitative data were coded to present results in quantitative or narrative form to give the reader an in-depth understanding of the research answers.

Sample Description

Trainees Who Participated in the Study

Of 25 trainees, 56% were female and 44% were male. All trainees were employed in the selected school district and were teachers (56%), principals (8%), or functioned in some other administrative role (36%). Trainees' ages ranged from 27 to 56 years, with the largest group (24%) falling in the 45-49 age range, followed by 20% in the 30-34 age range. Their experience in education ranged from 3 to 28 years. Twelve percent of trainees had experience as an assistant

principal while only 4% had experience as a principal. Surprisingly, 16 trainees had no prior experience with courses in the Web-based environment. Eight participants had taken online courses at a university; one trainee had used an online course management tool such as WebCT in a Web-enhanced course.

District-Based Instructor

The instructor had held the position of Chief Officer of Human Resources for eight years. The instructor, close to retirement, held a doctorate in education and had 29 years of professional experience. At the time of the preinterview, the instructor had no experience with online teaching.

Product Description

The instructional product consisted of two separate sites: the WBT introduction and the Human Resources module. The WBT introduction Web site consisted of four pages: (a) a sign-on page, (b) a copy of the district's training record, (c) an instruction page, and (d) a frequently asked questions page. The HR module consisted of 98 pages and addressed (a) employment, (b) master contracts (instructional and noninstructional), and (c) collective bargaining.

The module included internal hyperlinks, external hyperlinks, examples and nonexamples, and several graphics. Each major subsection had an overview of topics presented in the beginning of the section. Most pages included an overview of what learners could expect to find on the subsequent page for motivational purpose.

The menu consisted of a frame on the top of each page allowing participants to access pages such as (a) home, (b) table of contents, (c) communication, (d) technical support, (e) glossary, (f) links, (g) the three main subsections, (h) review, and (i) exit. In addition, the table of contents was linked to all major parts of the module. Learning activities included exercises and questions with answers found on a subsequent page to provide feedback in the form of a self-administered formative evaluation. A review/summary in the form of advanced organizers for each main subsection concluded the module. Then, learners were presented with four assignments developed by the instructor. The following page congratulated learners for completing the module, encouraged them to browse the module, and provided instructions on how to submit assignments and the posttest.

Results

Twenty-five participants completed and returned the prequestionnaire, pretest, and posttest. The evaluation questionnaire was completed and returned by 24 trainees. Twenty-three persons returned the journal with an average of six pages of entries. Ten trainees and the instructor were contacted for postinterviews and agreed to participate in the interviews. Two unbiased individuals conducted these interviews.

The Process

The production of the instructional product was completed with the use of existing models found in the literature pertaining to DE and instructional design (ID) even though the

instructional strategies employed were self-paced, self-directed, and interactivity was limited. Three ID models were followed in the production of the instructional product. One of the models was the systems approach model by Dick and Carey (1990). The second model, which guided all three phases of the research study, was the ADDIE model (Belanger & Jordan, 2000). The researcher also included the Web-based ID model (Downs, Carlson, Repman, & Clark, 1999). These models were helpful in guiding the creation of the instructional product and were combined to result in a more interactive process (Figure 1).

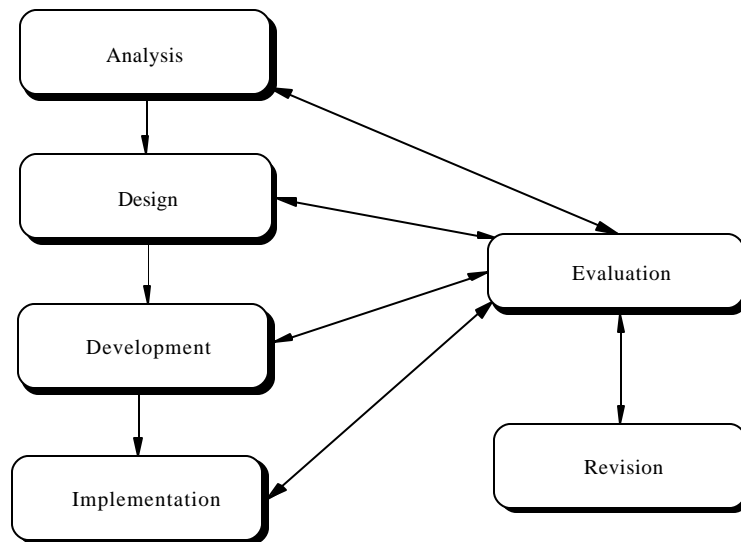


Figure 1. The Web-based ID model used in the production of the module.

The process of the design and development of the successfully produced instructional product for Web-based delivery was truly a team effort and went smoothly. Many parties were involved as suggested by Litchfield and Keller (2002). All parties and their roles follow: (a) the selected school district was the client; (b) the grant administrator supervised the overall project; (c) technical staff at the district and the university supplied technical assistance; (d) the district’s personnel office staff provided administrative support; (e) the district-based instructor and a university professor were the two SMEs in the field of school administration; (f) a university professor was the SME in the field of instructional technology and reviewed the WBT module; (g) a university professor of quantitative methods advised the researcher in the evaluation phase; (h) the instructor and two school administrators reviewed the WBT module prior to the field test; (i) the instructor and trainees were end users of the instructional product and subjects of the field test; (j) and the designer functioned as project manager, researcher, and the technical support contact person.

Trainees’ Performance

Pretest and posttest. The pretest and posttest was developed by the instructor and researcher. The tests were revised by a second SME in order to increase the validity of the

instrument. The final version of the test consisted of 44 multiple-choice questions. The pretest was completed before trainees had access to the Web site. The posttest was distributed at the end of the third week of the field test. The tests were returned by the trainees with the use of self-addressed, stamped envelopes to the researcher's personal residence.

After the posttest was returned, the reliability was analyzed using the Kuder-Richardson 20. The instrument's total reliability was high (.81). Because the reliability analysis revealed 18 of the 44 items had a very low or negative corrected item-total correlation on the posttest, an item analysis was performed. Several items did not have adequate distractors, but the reader is reminded the tests were criterion-referenced tests.

On the pretest, the lowest score was 21 and the highest score was 35. The most frequent score was 24, and the mean was 26.88. On the posttest, the lowest score was 26, and the highest score was 43. The most frequent scores were 40, 41, and 43; the mean was 37.56. A *t* test for dependent samples was performed to determine if the difference in scores were statistically significant. The analysis showed the group scored significantly higher on the posttest ($M = 37.56$) than the pretest ($M = 26.88$), $p < .001$. Table 1 contains the means, standard deviations, and variances of the mean scores listed by the group.

Table 1
A Comparison Between the Means, Standard Deviations, and Variances for Scores on Pretest and Posttest

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>r</i> ²	<i>t</i>
Pretest	25	26.88	3.53	12.44	
Posttest	25	37.56	4.57	20.92	8.86*

* $p < .001$

All but three of the trainees improved their performance on the posttest. One person scored one point less on the posttest than on the initial pretest, and two trainees showed no improvement. However, 22 trainees increased their scores by at least six points; the range of improvement in test scores was 6 to 21 ($M = 10.68$).

Assignments. Trainees had to complete four assignments developed by the instructor. These assignments were problem-based and were presented to the trainees at the end of the module. According to the instructor, completed assignments were of good quality. In the postinterview, the instructor said she thought she was able to assess trainees' ability to understand and apply the contents because the assignments were relevant and problem-based. She thought the training was effective in terms of trainees being able to achieve the instructional objectives. In the 10 interviews conducted after the WBT was completed, most trainees agreed the WBT was successful with only one person stating he was not sure.

Advantages and Disadvantages in the Web-Based Environment

Trainee responses. Respondents were asked to share the advantages and disadvantages they experienced in the WBT environment on the evaluation questionnaire after the training was completed. The majority perceived flexibility as an advantage. Respondents highlighted they could work at their own time, own pace, and choice of location in the online environment. Others indicated convenience, accessibility, ability to reread materials, ability to preview sections, not being distracted by others in the classroom, saving time, and timely instructor responses were of benefit.

The majority of trainees reported no disadvantages. The most reported disadvantages experienced were lack of discussions, technology problems, and lack of communication. Other disadvantages were trainees did not get to know others in the program; trainees did not have any personal contact with the instructor; and interaction between students and the instructor was limited.

One of the questions on the interview schedule was how the 10 trainees would feel about taking additional modules in the same setting. All 10 interviewees agreed they would take additional courses offered in this online format. One participant voiced she was looking forward to the next module.

Instructor responses. After the WBT was completed, the instructor was interviewed by an unbiased individual who was a school administrator in the district. The instructor thought the WBT was an improvement over having to meet in class. One advantage experienced by her was the convenience for the participants. She stated she enjoyed her training experience because trainees had a lot more materials at their fingertips because they were available on the Web. She was able to make more materials available to the trainees. The WBT was convenient for her because she could grade the materials as they were submitted to her. In her journal she wrote only one participant dropped out of the program. This retention rate is far better than past experience. Of approximately 15 participants, usually two or three would not complete the training because they had to miss class—emergencies at school, ball games, etc. Also, the instructor noted more trainees enrolled in the Web-based environment than in earlier classroom-based training sessions.

The only disadvantage in the WBT environment she mentioned in the interview was a motivational issue. She commented if individuals are not self-motivated, then submitting assignments is something they could easily forget. The instructor's last comment was, "The District should move more components in the Principal training to the Web."

Recommendations and Suggestions by Participants

Questionnaire results. A questionnaire was used in the third phase of the production process. This evaluation questionnaire had 49 questions and had eight subscales addressing (a) access, (b) communication, (c) content, (d) design, (e) support, (f) technology, (g) outcomes, and (h) general issues. The reliability of this survey had been established during a pilot study prior to administering the instrument to the sample in the evaluation phase of the instructional product; however, after the administration of the survey to the sample in this research, the internal reliability coefficient of the evaluation questionnaire using the Cronbach alpha was determined again. The reliability for the total scale was high (.97).

All negative items were recoded before the data analysis took place. The scale ranged from 1 (*strongly disagree*) to 4 (*strongly agree*) and had a total of 49 items. Out of a possible maximum score of 196, the lowest score on the post-WBT questionnaire was 119 and the highest score was 196. The mean for the total score was 152.33; the mean for the scale score was 3.26, indicating the respondents agreed with most of the items on the questionnaire.

All participants (100%) agreed or strongly agreed with 13 of 49 items on the instrument, at least 90% agreed or strongly agreed with 20 items, at least 80% agreed or strongly agreed with 10 items, and at least 70% agreed or strongly agreed with three items on the questionnaire. Only three items were agreed or strongly agreed with by less than 70% but not less than 55% of participants.

Specific recommendations or suggestions made by trainees on the questionnaire were to have a group meeting. Some individuals suggested having a meeting at the beginning of the training, some suggested having the meeting at the end, and others recommended having such meetings at both the beginning and end of the training. Other suggestions were to highlight only information not previously covered in academic courses. Respondents recommended having more work done on the Web and more interaction between teacher and students, perhaps through the use of threaded discussions. Other comments were to revise the review section, include more practice questions, and increase the number of post assignments to be completed by the participants.

Interview responses and journal entries. The 10 trainees who participated in interviews were asked if they had any other recommendations or suggestions at the conclusion of the interviews. Three respondents wanted more courses to be added. Several of them commented on how they could not think of anything at first. After they were given time to think about their answers, they were able to make some suggestions. Other suggestions not mentioned on the questionnaire included keeping the Web site simple and providing some alternative training option if computer problems occur.

One trainee asked for flexibility for teachers pertaining to time lines for the completion of future modules; however, she emphasized she did not have problems with this module. Recommendations collected from journal entries entailed much of the same. One trainee made the designer aware of the fact that one form had the incorrect form number displayed.

The instructor could not think of anything she would change regarding the process of designing this type of training and did not have any suggestions for changes regarding the meeting schedule, meeting agenda, or communication between parties. She expressed comfort with the ID of the module because the designer had worked closely with her. When asked if she had any suggestions for changes to the module, she did not have any.

Discussion

The Process

Instead of a linear model such as the systems approach model and the ADDIE model, a more interactive model was necessary for the completion of the instructional product. The Web-based ID model allowed for more interaction but included a dissemination step instead of an implementation step, as well as a combined evaluation and revision step. The combination of the three ID models allowed the researcher to adopt all phases of the ADDIE model, to add a separate revision step, and to include a constant interactive approach between all six steps. Each step of this model is interconnected with each of the other five steps and allows for maximum participation of all involved parties.

The highly interactive process was a necessity because the researcher included many stakeholders. This practice resulted in an interactive cycle of constant analysis, evaluation, and revision of the instructional product. Without the constant feedback loop from all involved team members, the resulting instructional product would not have been as successful.

Trainees' Performance

Trainees were asked to complete the pretest without assistance of any other source; scores ranged from 21 to 35 on the pretest. Trainees were able to use any materials they wished when they completed the posttest. Here, test scores ranged from 26 to 43. Test scores of all but three trainees increased by at least six points. One trainee scored one point less on the posttest than the pretest; two trainees had the same score on the pretest and posttest. The range of improvement of test scores was 6 to 21, and the mean was 10.68. These findings confirm reported results by the instructor: Trainees completed the WBT successfully.

Advantages and Disadvantages in the WBT Environment

Participating trainees. Because trainees found the WBT convenient, flexible, and accessible, they may have been willing to have limited interaction on the Web; however, the participants found other ways to bridge the distance by having face-to-face meetings and telephone conversations with other trainees. Trainees managed to avoid isolation by involving their administrators, colleagues, and family members in their learning and training activities.

Four trainees experienced equipment problems during the WBT. Many of the participants reported they had access to more than one computer. Because 40% of respondents reported they primarily accessed the Internet from home and 32% accessed the Web from home and work, the researcher concluded the majority of trainees had access in at least two places, work and home. These results indicate most trainees could have accessed the WBT from an alternative location should they have experienced difficulties with their primary equipment.

District-based instructor. The instructor reported more advantages than disadvantages. For her, experienced advantages were convenience, convenience for trainees participating in the field test, better access to more instructional materials provided via links in the module, a higher number of enrollment in the training, and a higher completion rate in the Web-based environment than compared to the classroom-based setting. The only disadvantage she noted was trainees had to be highly motivated to succeed in this type of setting. The instructor stated she

enjoyed her WBT experience and wanted to continue the training in this environment. Also, she recommended the district should increase offerings on the Web.

Suggestions and Recommendations by Participants

Suggestions not incorporated in the revision. Suggestions made by the participants to improve the WBT such as adding threaded discussions, streaming video, and group meetings before or after the training were not implemented. However valid these suggestions, they were not incorporated in the module at that time because of the nature of its purpose. The training was designed to offer open enrollment for participants to add to the convenience of all parties involved and was to be kept simple in order to save server space.

Suggestions incorporated in the revision. During the field test, the designer made necessary changes to the module after being contacted by participants. These changes pertained to instructions on how assignments were to be completed, how they should be submitted, and to whom they should be sent. In addition, personal information such as names and e-mail addresses were added to the communications page in order to encourage trainees to collaborate.

The suggestions such as not using the journal and completing more transactions on the Web have been incorporated. The journal was only to serve as an additional data collection tool for the researcher in order to evaluate the product. This practice will not be continued in the future. The posttest will be used by the instructor as a second tool assisting in the assessment of trainees' performance. After the field test was completed, the test was placed on the Web in order to utilize available Internet tools.

The teacher who expressed concern about flexibility in time lines does not have to worry. Because this will be an open enrollment training system, teachers will be able to complete future modules at their convenience. Participants will be able to complete the modules at their own pace and on their own time, as more courses will be added in the near future.

Overall Documented Success of the WBT

Satisfaction of participating trainees. Comments on the questionnaire were overall positive. Entries in journals confirmed the success of the WBT as well. All interviewed participants considered the training a success and would consider taking additional training components in this format. Trainees agreed they would recommend this training to others; two trainees had already recommended this training to other employees in the district.

During the postinterview, the instructor touched on the fact she received one complaint from a person who said she liked to meet, see other people, and talk about things. The instructor stated at least four people went out of their way to tell her directly they loved the WBT.

Satisfaction of the instructor. The instructor was satisfied with the training and would recommend implementation of WBT to other school districts. In the postinterview she stated, "I think any school district within the position of administrators . . . having more and more responsibilities, and more and more things to do, it is just tough for them to find the time to come meet and greet. And, if they can do things at 12 o'clock at night or whenever they can find time to do them, it is better for them."

Limitations of the Study

Some limitations in this study should be pointed out. First, due to economic restraints, a summative evaluation of the WBT was not feasible. Second, the school district was not randomly selected because it contracted with a higher education institution to create the WBT. The trainees who participated in this study were not randomly selected because they were selected by the School Board or were volunteers. Third, all participants in this research study were residents of the northwest Florida region and were employed in one school district; therefore, no attempt can be made to generalize the results of this study to other populations. Lastly, the reader is reminded the instructor had no prior teaching experience in the online DE environment.

Summary

The analysis of the collected data with several data collection tools confirms the success of the WBT product. Trainees were able to achieve instructional objectives as documented with the use of results from pretest, posttest, completed assignments, and the postinstructor interview. Journal entries, transcribed interviews with the instructor and trainees, and data collected on two questionnaires assisted in determining experienced advantages and disadvantages in the Web-based environment by participants.

Reported advantages outweighed disadvantages experienced by the sample in this study because participants expressed they would like to participate in additional WBT modules. All 10 randomly selected interviewees agreed they would recommend WBT to other individuals, and two trainees had already recommended the WBT to other teachers in the district. The instructor expressed she would recommend the WBT to other school districts. She stated she would recommend adding additional modules to the new training system. Several suggestions and recommendations were solicited from participants with data collection tools such as journal entries, instructor worksheet, a questionnaire, and interviews with the instructor and trainees. Many of these suggestions were valuable in the revision of the module.

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