Paper 1: Critical Analysis

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INTRODUCTION

This paper is a critical analysis of an article entitled, *Corporate Software Training: Is Web-Based Training as Effective as Instructor-Led Training?* This article appeared in the journal *IEEE Transactions on Professional Communication* in September 2002.

Type of Study

The article presents the results of a study designed to compare the effectiveness of web-based software training to that of instructor-led software training. The study is classified as experimental because it compared two groups of students to identify causal relationships between web-based and instructor-led training. However, the authors characterized the study a "case study" with a small sample size, and they conducted it in a "real-world" (uncontrolled) corporate setting. To be a true experiment, the study would need to be repeated with a larger sample size in a more controlled environment (Coppola & Myre, p. 184).

Stated Purpose and Reason for Conducting the Study

The authors, Coppola and Myre, are technical communications professionals whose stated purpose for conducting the study was to answer the following question: "Is web based training as effective as instructor-led training for adult learners in a corporate setting?" (Coppola & Myre, p. 170). In their introduction, the authors described the challenges of presenting instructor-led training in corporate environments in which the human resources required to provide training are limited. Since web-based training (WBT) requires fewer human resources than instructor-led training, the study was conducted to compare the effectiveness of each training method. Further, the study was

deemed necessary because prior studies showed mixed results when comparing WBT to instructor-led training. Further, recent technological advances may have improved the quality of WBT, and call into question the validity of prior studies (Coppola & Myer, p. 171).

Hypothesis, Questions, and Objectives

The authors state their hypothesis as, "…given the same external training parameters, the learning outcomes for web-based training and instructor-led training would be similar" (Coppola & Myre, p. 171). Effectiveness is determined by performance tests and evaluations conducted after the training.

Positive or Negative Bias Toward the Subject

The authors, who have backgrounds in academics and in business, provided a review of previous research on computer-based training or WBT. They described the prior studies objectively without either positive or negative bias, and they agreed with other researchers that prior studies had found "no significant difference" between instructor-led training and WBT. At the same time, they referenced other researchers (Gagné et al) who suggested that learning was not influenced solely by media, but by "sound instructional design" (Coppola & Myre, p. 173), and they stressed the important role that instructional design plays in training.

However, the fact that the authors proceeded with the study in light of previous research indicates that they had a strong interest in, if not a positive bias toward, WBT.

The Case for the Hypothesis

The authors clearly stated their hypothesis and objectives in the introduction. They summarized recent research, demonstrated the need for their study, and they restated their hypothesis and objective when they began their description of the study. The case for their hypothesis was compelling and well-formed.

RESEARCH PROCEDURES (METHODS)

This section describes the research procedures and methods used in the study.

Overview of Procedures and Methods

The authors listed the materials and methods used in the study, including a candidate questionnaire, the instructor-led and WBT training itself, the post-training test for learners, and a field test form used by a facilitator to evaluate learner performance. Prior to the study, potential test subjects completed the questionnaire to determine their understanding of English, computers, and WBT as well as their attitudes toward using computers and participating in training. The questionnaire was included in the article for reference. As the subject of the training, the authors chose ClientView, an Electronic Data Systems (EDS) software application. The software was selected because it was new at the time of the study, which meant that learners had not used it before, and the authors had access to a sufficient number of test subjects at EDS corporation.

Qualitative Sampling Procedures

The study drew 20 participants from an initial group of 40 candidates. The questionnaire enabled the authors of the study to select candidates that had the appropriate level of computer and software experience and the appropriate attitudes for the study. The fact that the questionnaires were completed anonymously encouraged

candidates to answer honestly and enabled the study authors to score questionnaires

without being influenced by the identity of the candidates. Further, because the study was

conducted on employees who would potentially use the software as part of their jobs, the

candidates were of high quality, making the study qualitative in nature, although small in

size. The questionnaire enabled the study authors to evaluate participants' skills, and

ensure that both the instructor-led and WBT groups included an even distribution of

computer skills, experience, and attitudes.

Description of Research Procedures

The study authors described the learning theories used as a foundation of their

study and they described the nine events of instruction used in training programs

(Coppola & Myre, p. 176). Later in the article, the authors explained how they employed

these learning theories and events in the creation of training materials. Detailed

information about each lesson, including screenshots of the WBT training and a

description of the instructor-led training were provided. In addition, the authors explained

the measures they took to ensure that both WBT and instructor-led training used the same

content and presented that content in the same order so that, "the same learned

capabilities (verbal information, intellectual skills, and motor skills)" were required in

both types of training. Further, instructors were told to use lesson plans without deviation

when they presented the materials to ensure that the instructor-led training was consistent

with the WBT version (Coppola & Myre, p. 180). Training materials and lesson plans

were described. However, to be able to replicate the study, it would be useful to have

access to the actual materials used in the training, as well as examples of the post-test and

field-test forms, similar to what was done for the candidate questionnaire.

In addition, the study authors took care to give all participants in the WBT the same instructions, and to use the same facilitator to evaluate all participants in the field test after the training was completed. This ensured consistency in the evaluation phase.

RESEARCH RESULTS

This section describes the statistical techniques used in the study as well as the conclusions drawn from the results.

Statistical Techniques

Statistical techniques in the study were sound. The study authors evaluated participants using a post-test that had a possible top score of 39. The authors provided information about the average, median, and "most common" scores for participants in the instructor-led and WBT sessions. The authors also provided standard deviation statistics. However, the authors emphasized that the study was not designed, "…to show statistical differences between performances of students in instructor-led and WBT environments" (Coppola & Myre, p. 182). Rather, the goal was to determine whether the effectiveness of instructor-led and WBT methods were different or similar, and the post-test scores were sufficient to prove or disprove the hypothesis.

Hypotheses or Questions that Emerged from the Data

When comparing their results to those of previous studies, the study authors drew distinctions between Computer Based Training (CBT) and Web Based Training (WBT). The former employs CD-ROM technology, and the latter uses Web-based techniques that are of higher quality and purportedly easier to design, implement, and use. According to the authors, previous studies that found instructor-led training to be more effective than computer-based training used the older CBT systems, which might not have been as

effective as WBT. The hypothesis is that CBT is not as effective as WBT, but that was beyond the scope of this study.

In addition, the authors referenced companies such as Dow Chemical, which, at the time of the study, expected to save "$20 million over the next three years" by implementing WBT systems. Since this study was conducted several years ago, data should now be available to show whether Dow's projections were realistic, and whether the EDS team developed additional WBT courses. (Coppola & Myre, p. 183-184).

DISCUSSION OF RESULTS

This section discusses the results reported in the study as well as implications for practice and future research.

Findings

The study showed that WBT was as effective as instructor-led training for teaching adults to use software. The authors suggested that future studies should be designed to determine whether WBT might also be effective for other subjects, such as policies and procedures (Coppola & Myre, p. 184).

Implications for Practice

The authors identified two practical applications that resulted from the study. First, the WBT materials used in the training were posted on the EDS intranet and available to employees as an alternative to instructor-led training. Second, based on the research in this study, the EDS Documentation and Training department began looking at WBT as a viable alternative to instructor-led training.

REFERENCES

Coppola, N. & Myre, R. (2002). Corporate software training: Is web-based training as

effective as instructor-led training? *IEEE Transactions on Professional

Communication, 45*(3), 170-186.