



Evidence Summary

A Web-based Tutorial May Produce the Same Cognitive Outcomes as Face to Face Instruction

A review of:

Beile, Penny M. and David N. Boote. "Does the Medium Matter?: A Comparison of a Web-Based Tutorial with Face-to-Face Library Instruction on Education Students' Self-Efficacy Levels and Learning Outcomes." *Research Strategies* 20 (2004): 57-68.

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Abstract

Objective – To determine whether library skills self-efficacy levels and learning outcomes of postgraduate education students varied with different instructional delivery methods, specifically Web-based or face to face.

Design – Pre- and post-intervention survey comparing three groups receiving different types of instruction.

Setting – Department of Educational Studies at a large U.S. urban university.

Subjects – Forty-nine masters, doctoral, and certificate-seeking education students enrolled in one of three sections of a

research methods course. There were 40 female and 9 male students.

Methods – Immediately before receiving library instruction, the three student groups were asked to complete a library skills self-efficacy questionnaire, comprising 30 items designed to measure students' perceptions of their ability to successfully perform library research. They also completed a library skills test, consisting of 20 multiple choice questions, designed to assess conceptual knowledge, knowledge of database searching, and institution-specific knowledge. The intervention groups were:

- Group 1 (Sixteen students) – an on-campus class that received a face to face instruction session comprised

of a 70-minute demonstration of key library databases followed by an activity that allowed students to practice their skills.

- Group 2 (Nineteen students) – an on-campus class that received a Web-based tutorial comprised of four interactive modules, requiring an average 80 minutes to complete.
- Group 3 (Nineteen students) - a Web-based class that received the same Web-based tutorial as Group 2.

The survey and test were repeated six weeks after the instruction.

Main results – Both self-efficacy scores and library skills test scores increased for all three groups post-intervention. Average self-efficacy levels increased from a mean of 68.88 (SD=19.92) to a mean of 91.90 (SD=16.24); library skills scores increased from an average score of 58.78 (SD=13.80) to an average of 73.16 (SD=12.65). There was no statistically significant difference between the post- intervention scores of the three groups on the library skills test. However, the Web-based students in Group 3 showed a statistically significant greater increase in self-efficacy score (78.86 to 102.36) when compared with Group 2 participants (64.74 to 83.68).

Conclusion – The study provides evidence that library instruction is effective in increasing both skill levels and self-efficacy levels. It does not give a clear indication of the relative value of different modes of delivery, but it does support the contention that Web-based tutorials are at least as effective as face to face sessions.

Commentary

This study is ambitious in attempting to compare three different combinations of settings and methods for delivering information skills instruction. The three

groups are fairly small (16, 19, and 14 participants respectively), and there is no way to determine the extent to which they are representative of the population of postgraduate educational studies students. Participants were not randomly assigned to the three groups. Participants in Group 1 and Group 2 had chosen to attend a campus class, and members of Group 3 had selected a Web-based class.

The study does not provide details as to how students were allocated between Group 1 (campus class with face to face instruction) and Group 2 (campus class with Web-based instruction). Group 3 students were however self-selected, having chosen to receive Web-based instruction, which suggests that they may have been more familiar with that mode of delivery. It would therefore be potentially misleading to conclude from the results that Web-based tutorials are more effective in a Web-based classroom than in a campus classroom. Another issue is that a large number of statistical procedures are reported in the findings without a great deal of explanation for those with limited knowledge of statistics.

A major strength of the study is that the post-intervention tests were conducted six weeks after the library instruction. We do, however, know very little about the two instruments themselves; it would have been helpful to include them as an appendix. The authors themselves draw attention to the fact that neither instrument had been validated with the sample population, although they had been tested in advance with a different sample. The authors also note that the multiple choice quiz used to test knowledge and skills may be of limited value and suggest that empirical observation of performance and/or analyzing the quality of references in a bibliography might yield more authentic outcomes. It would also have been helpful, from a practitioner perspective, to have more information about the content and

delivery of the face to face instruction. The brief description provided ("a 70 minute demonstration of relevant library databases, followed by an activity to allow the students to immediately apply the lesson" 61) suggests a far less engaging student experience than the interactive Web-based tutorial (<<http://library.ucf.edu/cmc/edtut>>), but this may underestimate the quality of the face to face teaching. One of the potential weaknesses of studies of this kind is that there is rarely any attempt to independently assess the comparability of the quality of the educational interventions, in order to isolate the influence of the mode of delivery.

This study is helpful in that it serves to support the hypothesis that library instruction has a positive influence on both library skills self-efficacy levels and learning outcomes. It also suggests that Web-based tutorials are at least as effective as face to face teaching sessions and that these may be successfully delivered either in the classroom or via the Web.