

Research Notes

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Library Instruction and Graduate Professional Development: Exploring the Effect of Learning Environments on Self-Efficacy and Learning Outcomes

Purpose

Few teachers use scholarly literature to improve their professional practice because they do not perceive the connection between research and practice (Kennedy, 1997). Although Kennedy does not suggest why this is occurring, other studies have indicated that students lack the requisite skills to access and retrieve information effectively (Fox & Weston, 1993; Greer, Weston, & Alm, 1991; Maughan, 2001). As a minimum, graduate education should improve teachers' ability and self-efficacy in library research.

In addition, extensive changes in library information systems, combined with a proliferation of field-based courses, have further confounded students' ability to access information effectively. Although many libraries are creating Web-based tutorials to accommodate a growing body of off-campus students, little research has been conducted that compares Web-based and traditional library instruction effectiveness.

Therefore, three hypotheses were suggested:

1. Higher levels of library skills self-efficacy would be positively correlated to library skills quiz scores.
2. Both library skills self-efficacy levels and library skills quiz scores would increase after treatment.
3. Library skills self-efficacy levels and library skills quiz scores would not vary significantly across learning environment.

Sample

The participants were 49 graduate students (40 female, 9 male) enrolled in one of three sections of a research methodology course in education at a large urban university. Participants were chosen based on enrollment in the course, the expectation that they would complete a review of the literature, and agreement to participate in the study.

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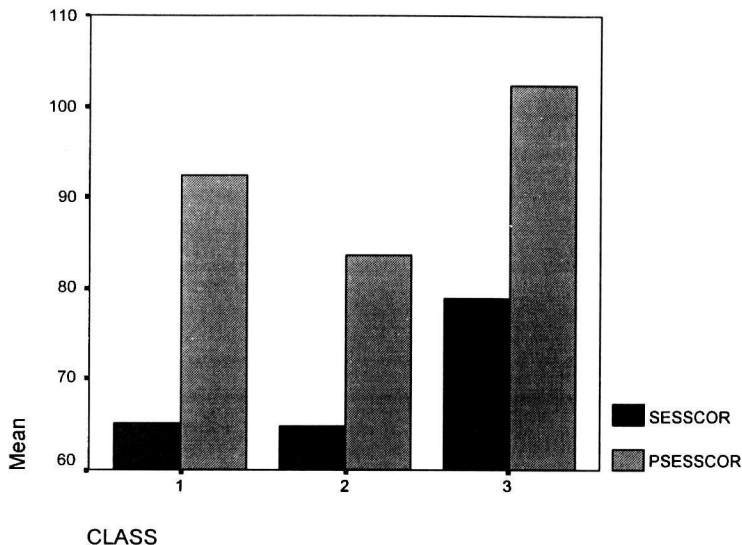
Methodology

Treatment consisted of three conditions: a campus-based class with face-to-face library instruction (Group 1, $n=16$); a campus-based class with Web-based library tutorial (Group 2, $n=19$); and a Web-based class with a Web-based library tutorial (Group 3, $n=14$). Face-to-face instruction consisted of a 65 minute demonstration of relevant databases followed by an activity to apply the lesson immediately. The Web-based tutorial consisted of four interactive modules on which participants spent an average of 80 minutes (the library tutorial can be accessed at <http://library.ucf.edu/cmc/edtut>). Self-efficacy levels and library skills were measured using scales constructed for the study. Surveys were administered immediately before instruction and repeated approximately six weeks later.

Findings

Data met Shapiro-Wilk's test of normality, thus supporting parametric analyses. Pearson correlation coefficients were calculated between both pretreatment library skills quiz scores and self-efficacy levels and posttreatment scores. Each indicated a moderate positive, statistically significant correlation (pretreatment $r(49)=.39$, $p<.05$; posttreatment $r(49)=.39$, $p<.05$), supporting hypothesis 1 that as self-efficacy levels increased, so would library skills.

As statistically significant correlations between the dependent variables met the assumptions of relationship for multivariate analysis, a repeated measures MANOVA was performed comparing self-efficacy levels and library skills quiz



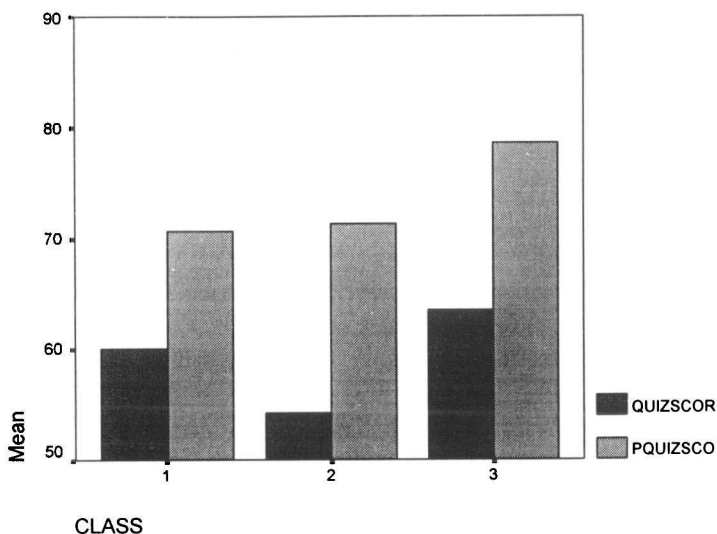
SESSCOR = pretreatment scores
 PSESSCOR = posttreatment scores
 Maximum Self-efficacy Score = 150

Figure 1. Pretreatment and posttreatment library skills self-efficacy levels by group.

scores before and after treatment. A statistically significant effect was found for self-efficacy levels ($F(1,48) = 47.72, p < .05, \eta^2 = .50$). Follow-up dependent t -tests revealed self-efficacy levels increased significantly (pretreatment $M = 68.88, SD = 19.92$; posttreatment $M = 91.90, SD = 16.24$; $t(48) = -9.28, p < .05$). A statistically significant effect was also found for library skills quiz scores ($F(1,48) = 124.11, p < .05, \eta^2 = .72$). Follow-up dependent t -tests indicated library skills quiz scores increased significantly (pretreatment $M = 58.78, SD = 13.86$; posttreatment $M = 73.16, SD = 12.65$; $t(48) = -7.51, p < .05$). These results support the second hypothesis, that self-efficacy and library skills quiz scores would increase after treatment.

Covariate analyses also require that the covariate be statistically significantly related to the dependent variable. A Pearson correlation coefficient calculation indicated pretreatment and posttreatment self-efficacy levels were significantly related ($r = .56, p < .05$), as were pretreatment and posttreatment library skills quiz scores ($r = .49, p < .05$). Prior library instruction was also significantly correlated with posttreatment self-efficacy levels ($r = .30, p < .05$) and posttreatment library skills quiz scores ($r = .28, p < .05$), thus meeting relationship assumptions.

A MANCOVA was performed controlling for existing pretreatment self-efficacy levels and library skills quiz scores and prior library instruction. Analysis indicated a statistically significant difference among the three treatment conditions ($F(4,84) = 2.52, p < .05, \eta^2 = .11$). Univariate F s, in between-subjects effects, revealed significant group differences on final self-efficacy levels ($F(2,43) = 3.97, p < .05, \eta^2 = .16$). Follow-up analyses indicated that Group 3 (adj



QUIZSCOR = pretreatment scores

PQUIZSCO = posttreatment scores

Maximum Library Skills Score = 100

Group 1—campus-based students with face-to-face library instruction session.

Group 2—campus-based students with a Web-based library tutorial.

Group 3—distance students with a web-based library tutorial.

Figure 2. Pretreatment and posttreatment library skills quiz scores by group.

$M=98.70$) demonstrated statistically significantly higher self-efficacy than Group 2 (adj $M=85.62$), ($F(2,46)=6.59$, $p<.05$, $\eta^2=.27$). This finding did not support one expectation of hypothesis 3, that library skills self-efficacy levels would not vary across learning environment. No statistically significant differences were found on final library skills quiz scores ($F(2,43)=1.40$, $p=.26$, $\eta^2=.06$), thereby supporting the second part of hypothesis 3, that library skills quiz scores would not vary across learning environment.

Conclusions

Regardless of learning environment, all groups improved their efficacy beliefs and library skills. Students who felt more efficacious demonstrated higher scores on the library skills quiz. Prior library instruction positively affected both self-efficacy levels and library skills quiz scores. This pattern suggests that repeated library instruction may have a cumulative effect on learning and self-efficacy.

Between-group patterns were not as easy to discern. Although differences in library skills quiz scores were not statistically significant between groups, statistically significant differences were found in self-efficacy levels. Posttreatment self-efficacy levels between Group 2 (campus-based students, Web-based tutorial) and Group 3 (distance students, Web-based tutorial) were significantly different. Group 2 demonstrated the greatest learning gains, but reported the lowest self-efficacy gains in between-group comparisons. These results may be explained by course instructor differences, differential comfort and facility with the electronic tutorial, sample size, or skewed sample, among others. Further research is warranted for a more complete understanding of these results.

Recommendations

These conclusions suggest at least three practical recommendations. First, Web-based tutorials appear to support students as well as traditional instruction, meeting the need for off-campus instruction to information resources. Second, as course syllabi become more compressed the Web-based tutorial may be a viable alternative to traditional library instruction. Finally, library instruction positively influenced library skills self-efficacy and learning outcomes across groups. Effective library skills enable teachers to search, retrieve, and critically evaluate information for their professional practice and should be an integral part of teacher education programs.

Note

An earlier version of this paper was presented at the annual meeting of the American Educational Research Association, New Orleans, LA, April 25, 2002.

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