

Demonstrating Tutoring Effectiveness Within a One-Semester Course

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The results of college-level tutoring programs are best described as mixed. Although some studies have detected beneficial effects (Lidren, Meier, & Brigham, 1991; Longuevan & Shoemaker, 1991), others reveal no positive tutoring effect (Griffin & Griffin, 1995). In 1986, McKeachie concluded that there are few clear demonstrations of the benefits of undergraduate peer tutors. The present study attempted to contribute additional evidence to understanding the effect of peer tutors in the undergraduate classroom.

Peer-level tutoring has been studied for some time in elementary and middle schools. For example, Dougherty and Taylor (1983) report a study conducted with middle school peer helpers using a pretest-posttest comparison group design. They utilized a number of commercially available testing instruments, such as the Survey of Student Helping Responses, Carkhuff Empathy Scales, and the Facilitator Competency Test. They found changes in classroom behavior, attendance, grades and self-concept for the peer helpers, but did not study those students being helped.

Other studies have been conducted in this area as well. Phillips, Hamlett, Fuchs, and Fuchs (1993) found that, in a peer-tutoring program in the public schools for children in grades 2-5, peer tutoring was generally helpful, especially for learning disabled students. Cohen, Kulik, and Kulik (1982) concluded from their comprehensive meta-analysis of 65 elementary and secondary school tutoring programs that (a) tutored students benefit more academically and develop more positive attitudes toward the subject matter when compared to nontutored students; (b) the tutors themselves benefit by gaining a better understanding and also develop positive attitudes; and (c) regardless of being tutored or being the tutor, there is little to no effect on self-esteem. The benefits of tutoring at the elementary school levels seem clear; the evidence is not so strong for college-level tutoring programs.

Such efforts at systematically studying peer tutoring at the undergraduate level are more difficult to find, and those demonstrating effectiveness of the tutoring program are rare. In fact, Brandwein and DiVittis (1985) stated that "few quantitative measures which imply the success of these peer tutoring programs exist in the literature" (p. 15). In Maxwell's (1990) literature review on college-level tutoring, she described a variety of tutoring programs and approaches used around the country. She concluded that when tutoring outcomes have been systematically studied, there are mixed results, and in some cases the level of success may be due to varying degrees of student preparedness; underprepared students who receive tutoring may not be improving their grades. She lamented that more research needs to be conducted in the area of tutoring effectiveness; the present study is one step in the direction of understanding the effectiveness of tutoring.

The approach of Brandwein and DiVittis (1985) was to invent a 3-part questionnaire containing some simulation questions (e.g., *What would you do if . . .*), and they concluded that tutored students ($n = 12$) responded more appropriately to the simulation questions than non-tutored students ($n = 13$). This study had its share of problems, with this conclusion based on a questionnaire with no demonstrated levels of reliability nor validity, difficulty in operationalizing the simulation outcomes, and a small sample size.

Other studies of college level tutoring demonstrate mixed results. Lidren et al. (1991) found significant improvements in overall course performance when comparing two tutoring conditions to control conditions. Using a multiple regression model, Longuevan and Shoemaker (1991) found that underprepared students who participated in a tutorial assistance program earned higher grades than expected based on the predictive model. However, Griffin and Griffin (1995), using reciprocal peer tutoring, found that

tutoring had no effect on achievement and self-efficacy but did increase test anxiety. We found essentially no discussion concerning gender differences and tutoring effectiveness. Clearly the results are mixed with respect to tutoring at the college level.

The present study was designed as an attempt to quantify the effects of being tutored at the college level. Our primary measurement instrument was the Learning and Study Strategies Inventory (LASSI; Weinstein, Palmer & Schulte, 1987; User's Manual, Weinstein, 1987). A pretest-posttest design was used in administering the LASSI at the beginning and end of a 16-week semester, and a comparison group also was tested.

METHOD

Participants. Undergraduate volunteers from the Physiological Psychology course at Boise State University during the Fall 1993 and Fall 1994 semesters participated in this study. Across the two semesters, 48 students participated; 30 attended at least one tutoring session, whereas 18 did not attend any tutoring session during the entire semester.

Materials. The Learning and Study Strategies Inventory (Weinstein, Palmer, & Schulte, 1987) was given to each participant at the beginning and again at the end of the semester. The Learning and Study Strategies Inventory (LASSI) "is an assessment tool designed to measure students' use of learning and study strategies and methods. It is a diagnostic and prescriptive measure. The focus is on both covert and overt thoughts and behaviors that relate to successful learning *and* that can be altered through educational interventions [emphasis in original]" (p. 4). Details about the LASSI subscales can be found in Weinstein (1987) and Weinstein et al. (1987). Additional measures available at the end of each semester included student scores on instructor-generated tests, number of tutoring sessions attended, and gender.

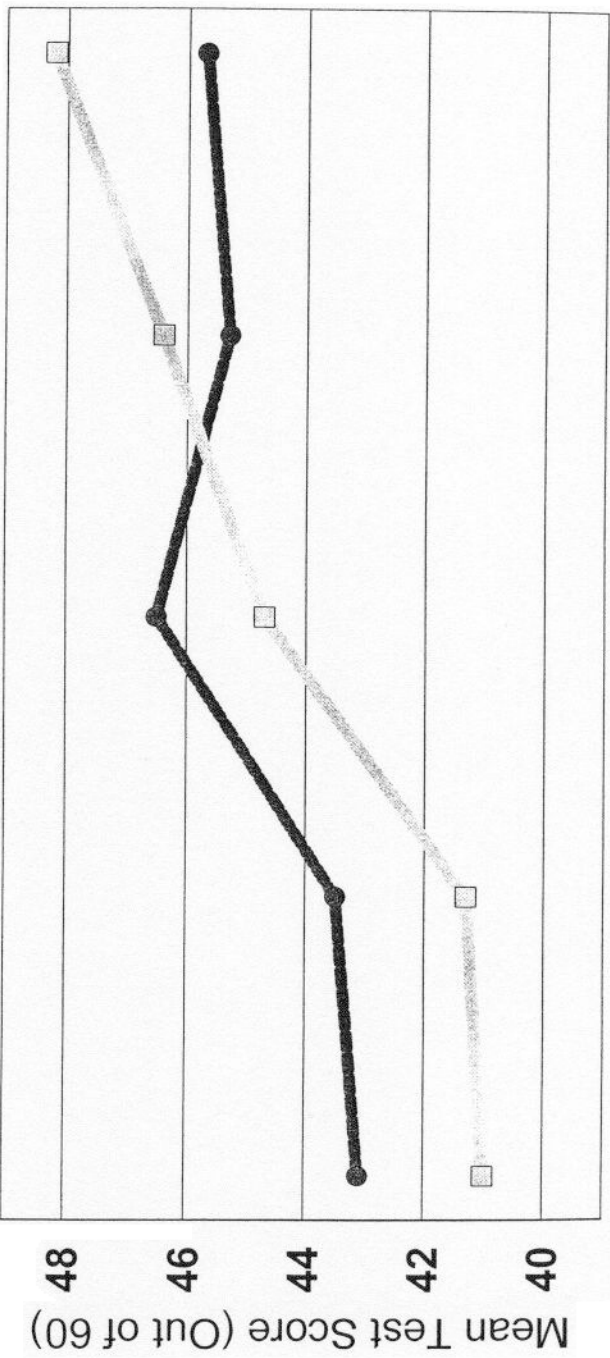
Procedure. At the beginning of each semester, before any tutoring sessions had occurred, a randomly-selected group of 30 students were asked if they would volunteer to take the LASSI at the end of a class period. No allusion was made

to the fact that this inventory was related to a student's decision to seek tutoring or not. Students who volunteered at the beginning of the semester, regardless of whether or not they attended tutoring, also were asked to complete another LASSI form at the end of the semester. During the Fall 1993 semester (out of 87 total students in the class), 22 students completed the LASSI pre-test and LASSI post-test; during the Fall 1994 semester (out of 86 total students in the class), 26 students completed both LASSI administrations.

During the semester those students seeking tutoring help were asked to sign in when they attended a tutoring session. Thus for each participant, we counted the number of tutoring sessions attended; this measurement be expressed in a variety of forms (tutored vs. not tutored, proportion of possible tutoring sessions attended, etc.). Additionally, scores on the five classroom achievement tests given throughout the course were available, as was gender information. Also available was the semester the class was completed, and analyses for semester differences found no significant main effect or interaction involving semester. Given that no significant differences appeared in student performance between semesters, and that the instructor was the same, the text was the same, and the general format and difficulty of the tests were the same, the results reported below are collapsed across semesters.

RESULTS

Is it possible to demonstrate a quantitative advantage for students who receive tutoring at the college level? Our answer based on the present study is "yes." A repeated measures ANOVA of the five test classroom achievement scores comparing students receiving tutoring and those not receiving tutoring revealed significant changes over time, $F(4, 184) = 3.52, p < .01$. This result also is depicted in Figure 1. Students self-selected into tutored and non-tutored groups, and initially (Tests 1-3) the non-tutored groups scored higher (but not significantly) than those who chose to be tutored. By the end of the semester and Test 5, the crossover interaction



Significant interaction involving non-tutored vs. tutored group performance on five tests given throughout the semester.

clearly shows the change in test outcomes, which is also indicated by a number of times tutored by Test 5 score correlation, $r(46) = .295, p < .05$.

We also attempted to demonstrate and quantify the effectiveness of college-level tutoring by administering the LASSI at the beginning of the semester (pre-test) and at the conclusion of the semester (post-test). Results of the majority of significance tests conducted on the LASSI pre-test post-test data were non-significant; however, some significant results did emerge when LASSI results were related to tutoring. For example, the number of times tutored was significantly correlated with motivation at the beginning of the semester, $r(46) = .322, p < .05$, indicating higher motivation scores on the LASSI for those who sought out more tutoring (note that motivation scores were not different between the groups by the end of the semester). Motivation may play a role in student self-selection into tutored or non-tutored groups, but it cannot account entirely for differences at the end of the semester as there were no end of the semester motivation differences between groups. Another significant result was the correlation between tutoring status (tutored or non-tutored) and anxiety (measured by the LASSI) at the end of the semester, $r(46) = -.344, p < .05$, indicating that students who received tutoring were more anxious at the end of the semester than those who did not receive tutoring, a result similar to that observed by Griffin and Griffin (1995). The only statistically significant difference between the genders indicated that males sought tutoring services more frequently than females, $t(28) = 2.99, p < .01$.

DISCUSSION

A number of prior studies at the elementary school level have demonstrated the academic benefits of tutoring programs for students (Cohen et al., 1982). The present study was able to extend that conclusion to an undergraduate sample. Perhaps one key to the success of demonstrating tutoring effectiveness here was the context of five tests during the semester. That number of attempts probably allowed students to revise their

study strategies over the course of the semester, and tutoring allowed some direct feedback as to the effectiveness of study strategies. Examination of Figure 1 demonstrates the advantage of five tests being given by the instructor; if there had been only three tests in the course, with the present data, we would have concluded that tutored students were moving in the "right direction" yet not significantly. This crossover interaction was significant in the present study, and students in the tutored group scored lower on the first classroom achievement test than non-tutored students (completely self-selected), yet scored higher on the last two classroom achievement tests. Hence, one method of overcoming the difficulty of demonstrating tutoring effectiveness (Brandwein & DiVittis, 1985) may be to allow multiple occasions (i.e., multiple tests) for students to demonstrate their competency with the subject matter.

The Learning and Study Strategies Inventory was not as successful in capturing change over time as we had hoped. This may be due to subtle, small changes in study strategy characteristics not measurable by the LASSI (that is, the effects are not very robust), too little time passing for the LASSI to capture the effects (it may be better at assessing traits than states), or it could be simply that there were few strategies that changed over the semester for either the tutored or non-tutored group, and the LASSI captured only those effects that truly are present. Cohen et al. (1982) commented that, although academic effects were clearly demonstrated for schoolchildren who received tutoring, there was little to no effect on self-esteem. Perhaps in a similar vein, at the college level tutoring can be effective in the areas of academic improvement but less influential in areas such as attitude, time management, concentration, and self-testing.

Gender differences also played a role in the outcomes of the present study. Males sought tutoring more than females. This result as well as others in the present study (i.e., motivation, anxiety differences, but these did not differ significantly between the genders) do suggest that the LASSI is sensitive to some patterns of differences. Given the limitations of the present

study (including sample size in some analyses), caution should be taken not to overgeneralize the findings.

Capturing the effectiveness of college tutoring can be elusive. We recommend giving students multiple opportunities to demonstrate their academic achievement within a semester as well as including multiple measures of different types of "effectiveness," however characterized and operationalized. We also encourage our colleagues to continue to measure the effects of tutoring, perhaps focusing on additional measures that might be sensitive to subtle changes over short periods of time (one semester). Such measures will allow easier reporting and justification of tutoring programs to the relevant parties of the university community.

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