

TEACHING APPROACHES AND SELF-EFFICACY OUTCOMES IN AN UNDERGRADUATE RESEARCH METHODS COURSE

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ABSTRACT

This study investigated the outcomes of teaching objectives and techniques in an undergraduate research methods course. In particular, the study examined student perceptions of their relative comfort level with performing specific research tasks during the first and fourteenth weeks of a fifteen week semester. Results indicated that students' comfort level increased significantly. Whether students had conducted or participated in research as a subject prior to the course, in general, played little role in the measured increase in research comfort level. Implications for educators teaching an undergraduate research methods course are discussed.

I. INTRODUCTION

For many years our department has required research methods as a core curriculum course for our undergraduate majors. The rationale behind this requirement is multifaceted. First, faculty believe an important learning outcome for our undergraduates is the ability to critically examine claims about communication. Second, faculty believe training in research skills prepares students to construct more credible claims (see Winn, 1995). Third, research requires discipline, which in a course designed to engage students in the research process can become a potent learning outcome. Despite faculty belief in the importance of having a research methods course in the core curriculum, students seem to carry a relatively high anxiety about the subject matter and task requirements in such a course. Regardless of how the course is framed, faculty observe characteristic student fear associated with steps in the research process, particularly with units on statistics. Therefore, an important but implied learning objective for an undergraduate research methods course is the reduction of fear, or the increase in comfort level, for performing specific research tasks. The purpose of this study was to investigate the relationship of teaching outcomes to objectives and techniques in an undergraduate research methods course.

II. REVIEW OF LITERATURE

In the social sciences, requiring undergraduate students to take a research methods course, while not universal, is fairly common (see Thies and Hogan, 2005). For undergraduate communication majors, the necessity for the required research methods may not be clear, particularly if those students do not intend to go on to graduate school. As Clark (1990) points out, communication students tend to be more apprehensive about the skills needed for a research methods course, particularly their mathematical skills, for which they may perceive a deficiency (see also Maier & Curtin, 2005; Winn, 1995). For these students, the role of the teacher includes guidance in the techniques for conducting research using a variety of teaching methods (Dobratz, 2003). To accomplish this role, the teacher has to structure a course to promote student self-efficacy (Maier & Curtin, 2005). One such approach of course structure was described by McBurney (1995) and Sproken-Smith (2005). McBurney suggested using a problem-based approach to teaching research methods in which

students were presented with problems requiring critical thought and creativity to solve. This pragmatic problem-based approach could achieve the overall course goal of training students to construct more credible claims. A problem-based approach could focus on the design of a project or proposal which requires students to both make choices for particular research methods and to justify those choices (McBurney, 1995). Additionally, a problem-based approach could result in a range of transferable skills which may be relevant in the workplace (Sproken-Smith, 2005). However, as Winn (1995) pointed out, requiring a completed project may be impractical for a variety of reasons including the amount of time required by faculty in administering projects for larger classes. Winn (1995) and Clark (1990) suggested requiring students to complete a research proposal which does not require data analysis on individual student projects. Similar to those suggestions for structuring research methods courses given above, the research methods course in the current study has structured assignments as subsections of a research proposal. Each assignment is evaluated independently from other assignments. However, each assignment builds upon the tasks accomplished in the previous assignment.

The overall goal for teaching any course is to increase understanding and skill in applying course related material to real life situations. This goal is especially important in the undergraduate research course where, as it has been noted above, students come into the course with considerable trepidation about the course requirements. Ultimately, students should achieve some sense of accomplishment as well as mastering course material in order to realize a level of self-efficacy necessary to overcome research anxiety. To determine if this goal has been achieved, the following research questions are proposed:

- RQ₁ Is there a measurable change in undergraduate students' perceptions of their own abilities to critically examine and conduct research?
- RQ₂ Does having prior experience conducting research make a difference in comfort level with research tasks for students enrolled in an undergraduate research methods course?

III. METHODOLOGY

The participants were 52 students in 3 distinct sections of an undergraduate research methods course. Average class size was 29.67 students. However, only those students in the three sections which completed both the pre-test and post-test survey were included in the sample. The students attended a large research intensive school in the southwestern United States. Over 96 percent of the students were liberal arts majors. However, approximately 86 percent of the sample consisted of communication majors. Other demographic characteristics of the sample included classification and study concentration. Juniors comprised the largest group (53.8%), with seniors (32.7%), and sophomores (13.5%) making up the difference. Half of the students in the sample listed public relations as their study concentration. Other areas of concentration reported were technical communication (23.1%), social interaction (11.5%), and other concentrations (15.4%). Twenty-seven students (51.9%) reported having previously conducted research, and 35 students reported having previously participated as a research subject (67.3%). Data for the study were gathered using the Research Comfort Level Inventory (RCLI). The RCLI contained 10 five-point Likert type statements regarding specific steps in the research process from selecting a topic for research (statement 1) to discussing findings (statement 10). Participants were asked to rate their relative level of comfort with performing the specific research task from very uncomfortable (1) to very comfortable (5). The RCLI was administered during the first (pre-test) and fourteenth (post-test) weeks of a fifteen week semester. The reliability of the RCLI the pre-test condition was

sufficiently high ($\alpha = .86$). For the post-test condition, the reliability of the instrument was very high ($\alpha = .90$).

IV. RESULTS

When averaging the scores for the pre-test dependent variables and comparing them to the average scores for the post-test dependent variables, results indicated that a measurable and positive change in undergraduate students' perceptions of their abilities to critically examine and conduct research. Specifically, students reported more comfort in accomplishing all ten research tasks at the end of the semester ($M = 3.83, SD = .73$) compared to the beginning of the semester ($M = 3.11, SD = .70$), $t(51) = -6.27, p < .01, \omega^2 = .42$. Correlation between the pre- and post- conditions was both moderate and significant ($r = .33, p = .017, N = 52$).

To determine whether having prior experience conducting research affected research comfort level, a factorial Repeated Measures ANOVA was performed on each research task. Overall, having conducted research prior to the class did not influence research comfort level. Students, regardless of experience reported increased comfort with each of the research tasks with the exception of discussing findings. That is, no between-subjects effects were found. Additionally, no interaction effects were uncovered in the analysis. The results for each test are reported below. For the task of selecting, developing and narrowing a topic for research, students reported a significant increase in comfort level at the end of the semester ($M = 4.02, SD = .98$) compared to the beginning of the semester ($M = 3.38, SD = 1.14$), $F(1,50) = 12.58, p = .001, \eta^2 = .20, Wilks' \Lambda = .80$. As reported above, no between-subjects or interaction effects were uncovered. For the task of creating a plan for searching through the literature, students' comfort level also increased from the beginning of the semester ($M = 2.92, SD = 1.03$) to the end of the semester ($M = 3.77, SD = 1.06$), $F(1,50) = 22.31, p < .001, \eta^2 = .31, Wilks' \Lambda = .69$. Table I below shows the means and standard deviations for the pre- and post-conditions representing students' perceptions of their comfort level with tasks 3 through 9. Table II shows the repeated measures within-subjects effects for tasks 3 through 9. As with tasks 1 and 2, there were no between-subjects or interaction effects for these tasks.

Table I
Central Tendencies For Comfort Level With Research Tasks

Task	Pre-condition		Post-condition	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
3. Choosing search tools	3.04	.99	3.94	.92
4. Evaluating sources	3.31	1.02	3.90	1.18
5. Citing Internet sources	3.38	1.03	4.02	.98
6. Organizing the literature review	3.19	1.10	4.04	1.03
7. Developing hypotheses	2.98	1.11	3.88	.98
8. Developing methods	2.85	1.04	3.69	.90
9. Analyzing statistics	2.54	1.06	3.25	1.01

Table II
Summary Of Within-Subjects Repeated Measures Analysis For
Comfort Level With Research Tasks Pre- Versus Post-Condition

Task	<i>df</i>	<i>F</i>	η^2	<i>p</i>	Wilks' Λ
3. Choosing search tools	1,50	23.58	.32	.000	.68
4. Evaluating sources	1,50	10.68	.18	.002	.82
5. Citing Internet sources	1,50	15.76	.24	.000	.76
6. Organizing the literature review	1,50	20.83	.29	.000	.71
7. Developing hypotheses	1,50	27.05	.35	.000	.65
8. Developing methods	1,50	19.94	.28	.000	.72
9. Analyzing statistics	1,50	16.79	.25	.000	.75

For the task of discussing findings, students' comfort level appeared to increase slightly from the beginning of the semester ($M = 3.46, SD = 1.09$) to the end of the semester ($M = 3.77, SD = .96$), although no statistically significant difference was found either within-subjects or between cohorts of students who had previously conducted research and those who did not. Additionally, no interaction effects were found between having conducted research previously and having attended a class in research methods. Several post-tests were conducted to determine if other characteristics of students impacted the results. In particular, the researcher was interested in determining if having prior experience participating as a research subject made a difference in perceived level of comfort in performing research tasks for students enrolled in an undergraduate research methods course. Both between-subjects effects ($F(1,50) = 4.05, p = .05, \eta^2 = .07$), and within-subjects effects ($F(1,50) = 9.85, p = .003, \eta^2 = .07, \text{Wilks' } \Lambda = .83$) were uncovered for the task of selecting a topic (1). Table III below shows the means and standard deviations for the pre- and post- conditions for task one for students who had or had not previously participated as a research subject. No interaction effects were uncovered between cohorts of students and condition for research tasks. Additionally, no between-subjects effects were uncovered for research tasks 2 through 10.

Table III
Central Tendencies For Comfort Level With Selecting A Topic

	Research Participant?	<i>M</i>	<i>SD</i>
Pre-condition	Yes	3.20	1.21
	No	3.76	.90
Post-condition	Yes	3.89	1.05
	No	4.29	.77

The researcher was also interested in determining if student classification made a difference in research comfort levels for undergraduate students. No between-subjects or interaction effects were uncovered, although a significant within-subjects effect was found ($F(1,50) = 31.04, p < .001, \eta^2 = .39, \text{Wilks' } \Lambda = .61$). Finally, the researcher was interested in determining whether the study concentration of a student made a difference in perceived comfort levels with research tasks. Results indicated that concentration made no difference in perceived comfort levels with research tasks, although within study concentration categories comfort level increased from the beginning of the semester to the end of the semester ($F(1,50) = 36.91, p < .001, \eta^2 = .43, \text{Wilks' } \Lambda = .57$). No interaction effects were found between study concentration and perceived comfort level with research tasks.

V. CONCLUSION

In general, undergraduate students enrolled in a research methods course reported increased comfort in performing research related tasks from the beginning to the end of the semester. Results indicated that prior experience conducting or participating in research had little or no effect on comfort level. The results were particularly interesting for data analysis which, as noted in previous research, was the most vexing aspect of the research methods course for students. In this study, the subjects were not required to conduct data analysis for their research proposals. Yet, students felt more comfortable with undertaking data analysis, perhaps as a result of observing how data analysis fits in the process of conducting empirical research. McBurney (1995) suggested that requiring students to engage the research process by making choices about topic, research questions or hypotheses, and method of observation and data collection influences students to think critically about expected results and the implications of those expected results. Engagement in the research process, with this subject pool, appeared to promote self-efficacy. Indirectly, a major concern of faculty that students critically examine claims is accomplished by providing for students an opportunity to view themselves as capable of doing so. If students engage the process successfully in a controlled classroom environment, then the secondary goal of providing students with the tools to construct more credible claims can be met. Although many undergraduate students may not choose to attend graduate school or pursue careers that require empirical research skills, in the field of communication, the ability to critically evaluate information is a necessity (see Winn, 1995). The current study only examined students' perceptions of their own comfort level with specific research tasks. This study did not test objectively measurable learning outcomes such as mathematical ability. Given the pre-post design of the study, faculty expectation of student ability to select appropriate statistical tests or analyze results in the pre-condition may be unrealistic. Additionally, the course used in the study focuses primarily on survey-based quantitative research methodology. Although several weeks are spent discussing qualitative research methods and methodology, as a practical matter the course is structured to provide maximum benefit from engagement in a research project. Tashakkori and Teddlie (2003) provide a persuasive argument for taking a mixed-methods approach in the social and behavioral sciences due to the complexity of human phenomena and the kinds of questions such phenomena engender. The authors suggest that approaches to teaching research methods in the social and behavioral sciences have to adapt to the needs of students to understanding both qualitative and quantitative approaches and the questions those approaches are designed to answer. With a required course in a program with several hundred undergraduate majors, a mixed methods approach has some considerable practical limitations.

REFERENCES

- Clark, Ruth A. "Teaching Research Methods." In J. A. Daly and Associates, eds., Teaching Communication: Theory, Research, and Methods. Hillsdale, NJ: Lawrence Erlbaum, 1990, 181-191.
- Dobratz, Marjorie C. "Putting the Pieces Together: Teaching Undergraduate Research from a Theoretical Perspective." Journal of Advanced Nursing, 41, (4), 2003, 383-392.
- Irish, Donald P. "A Campus Poll: One Meaningful Culminating Class Project in Research Methods." Teaching Sociology, 15, (2), 1987, 200-202.
- Maier, Scott R., and Patricia A. Curtin. "Self-efficacy Theory: A Prescriptive Model for Teaching Research Methods." Journalism and Mass Communication Educator, 59, (4) 2005, 352-364.

- McBurney, Donald H. "The Problem Method of Teaching Research Methods." Teaching of Psychology, 22, (1), 1995, 36-38.
- Scheel, Elizabeth D. "Using Active Learning Projects to Teach Research Skills Throughout the Sociology Curriculum." Sociological Practice, 4, (2), 2002, 145-170.
- Spronken-Smith, Rachel. "Implementing a Problem-Based Learning Approach for Teaching Research Methods in Geography." Journal of Geography in Higher Education, 29, (2), 2005, 203-221.

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