

*Teachers learning research:
Does online instruction impact anxiety and comprehension?*

Howard V. Coleman
University of North Carolina at Wilmington
Jeremy Dickerson
East Carolina University

Objectives

Previous studies have revealed that many students who enroll in research courses with negative and apprehensive attitudes have difficulties learning and usually demonstrate low achievement standards (Earley, 2007, Pan & Tang, 2005; Murtenon, 2005; Dauphinee, Schau, & Stevens, 1997; Adams & Holcomb, 1986). These studies identified instructor support for students and a variety of instructional methods as helpful strategies which reduce students' anxieties and apprehensions.

This paper evaluated the effect of using a variety of supportive instructional techniques on teachers' attitudes towards research in a blended, face-to-face/online introductory research course. Teachers' attitudes towards research at the beginning of the course and at the end of the course were measured and compared to determine the impact of using a combination of face-to-face and online instructional methods. The following questions were addressed: How are teachers' attitudes toward research affected by blended face-to-face/online courses? Does blended face-to-face/online delivery improve teachers' perceptions of research or does it magnify problematic issues already associated with this material? How do online components affect instructional decisions, delivery and teachers' performance in educational research and statistics courses?

Theoretical Framework

Researchers have used attitudinal surveys to assess student attitudes towards research courses (Dauphinee, Schau, & Stevens, 1997; Schau, Stevens, Dauphinee, Vecchio, 1995; Zeidner, 1991; Wise, 1985; Roberts & Bilderback, 1980). These attitudes towards research surveys generally consist of multi-dimensional scales designed to measure student attitudes on the following: a) usefulness of research; b) anxiety towards research; c) positive responses towards research; d) relevance of research to life; e) difficulty of research. The attitude towards research survey instrument selected for this paper was developed by Papanastasiou (2005). The survey contains fifty-six, Likert type items designed to measure students' attitudes towards research on five domains: a) research usefulness for the profession; b) research anxiety; c) positive attitudes towards research; d) relevance to life; and e) the difficulty of research.

The Attitudes Toward Research (ATR) scale created by the Papanastasiou consisted of items listed on a 7-point Likert scale with options ranging from "strongly disagree" to "strongly agree." Papanastasiou used Cronbach's alpha coefficient to measure the internal consistency of the items in the scale and determine the reliability of the ATR measure. The responses on the ATR survey indicated a high reliability for the test, ($r=0.948$). The coefficient alpha reliabilities

for the responses to items on each of the five subscales were also relatively high. Coefficient alpha reliability for the research usefulness in the profession factor was 0.919; for the research anxiety factor, it equaled 0.918; the reliability for the positive attitudes toward research factor equaled 0.929. The reliability of the life relevancy factor equaled 0.767, while the reliability for the research difficulty factor equaled 0.711.

Methods

This study used Papanastasiou's ATR survey to measure teachers' pre and post attitudes towards the research in education course and the online instructional components. The sample for the study included 30 teachers enrolled in an introductory research and statistics course. All students were employed in public schools as teachers at the elementary, middle, or high school level. The research in education course is required for all graduate level teachers in the school of education. The instructor administered the ATR survey to students on the first day of class and again on the last day of class. All of the students stated they were taking their first research course.

Data Sources

The researchers modified Papanastasiou's Attitude Towards Research instrument to include attitudes toward technology and online instruction survey questions. Student email and verbal class responses were collected to provide additional data sources to be compared to survey responses. Students also provided written responses to structured, open-ended attitude towards research questions and online instruction on the last day of class.

Results and Conclusions

How are Teachers' Attitudes Toward Research Affected by Face-To-Face/Online Courses?

The data analysis of the pre-course survey responses revealed that the majority of students had anxiety and apprehension towards research on the first day of class (see Figure 1). Seventy percent of the students agreed or strongly agreed that research made them anxious. Sixty-four percent of the students indicated that they felt insecure about analyzing research data. Forty percent of the students agreed or strongly agreed that research scared them. Eighty percent of the students agreed or strongly agreed that research was stressful. Student emails and verbal communications during the first two weeks of the class were congruent with the pre-course anxiety, apprehension, insecurity, and stress survey responses.

Student post-course survey responses were more positive and indicated less anxiety towards research. Thirty-five percent of the students agreed or strongly agreed that research made them anxious. Thirty-four percent of the students indicated that they felt insecure about analyzing research data. Seventeen percent of the students agreed or strongly agreed that research scared them. Sixty-two percent of the students agreed or strongly agreed that research was stressful. Student emails and verbal communications during the last week of the class were similar to the post-course anxiety, apprehension, insecurity, and stress responses.

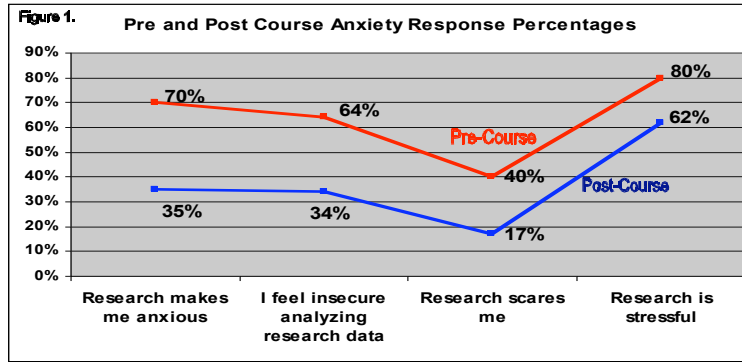
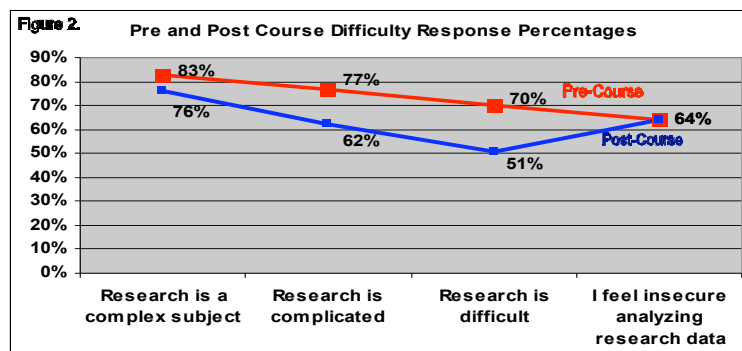
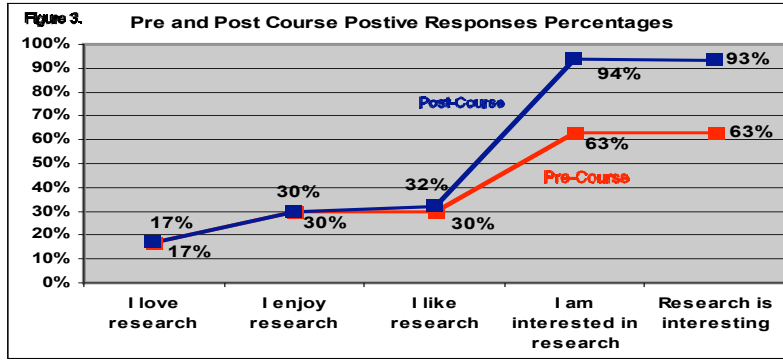


Figure 2 presents pre-course and post-course difficulty survey responses. On the first day of class, 83% of the students agreed or strongly agreed that *research is a complex subject*. Seventy-seven percent of the students indicated that *research is complicated*. Seventy percent of the students agreed or strongly agreed that *research is difficult* and 64% indicated that they *felt insecure analyzing research data*.

Student post-course survey responses revealed that 76% of the students agreed or strongly agreed that *research is a complex subject*. The percentage of students indicating that they thought *research is complicated* decreased from 77% before taking the course to 62% after completing the course. Similarly, the percentage of students who thought *research is difficult* decreased from 70% on the first day of class to 51% on the last day of class. Students' pre-course and post-course survey responses to *feeling insecure analyzing research data* were 64% before and after completing the course.

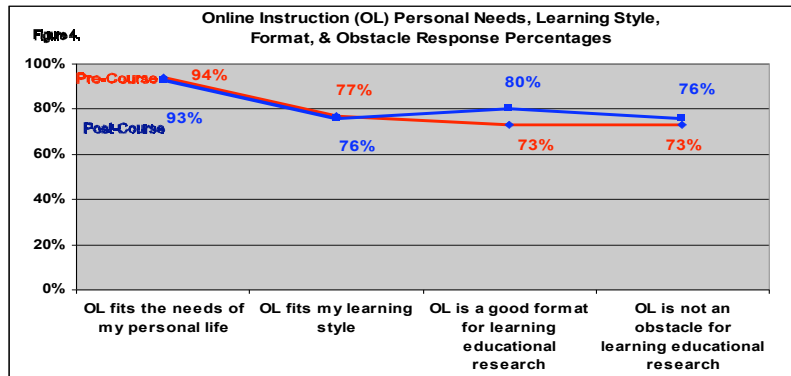


The pre-course and post-course responses to the “positive” survey items are presented in Figure 3. Student pre-course to post-course responses to the *I love research*, *I enjoy research*, and *I like research* survey items were the same on first day of class and the last day of class. Sixty-three percent of the students stated that they were interested in research on the pre-course survey versus 94% on the post-course survey. Student pre-course responses indicated that 64% of them thought research was interesting versus 93% on the post-course survey.



Does Blended Face-To-Face/Online Delivery Improve Teachers' Perceptions of Research?

Figure 4 presents student pre-course and post-course responses to the online instruction survey items. Ninety-four percent of the pre-course responses indicated that students agreed or strongly agreed that *online classes fit the needs of their personal lives* versus 93% of the post-course responses. Seventy-seven percent of the students' pre-course responses indicated that they considered *online instruction to fit their learning style* versus 76% of the post-course responses. Student pre-course responses to the *online instruction is a format for learning educational research* survey item were 73% versus 80% for the post-course responses. Student pre-course responses to the *online instruction are not an obstacle for learning research* survey item increased slightly from 73% to 76% after completing the course.



How do Online Components Affect Instructional Decisions, Delivery and Teacher Performance in Educational Research and Statistics Courses?

The purpose of the research in education course is to provide an overview of research methods for public school teachers. Major themes of the course include theoretical and practical knowledge in scientifically based inquiry, research design, and statistical analyses. The course goals are to develop students' skills in analyzing research studies and in using the scientific method to support effective decision-making. Research methodologies, validity and reliability concepts, correlational analyses, and tests of significance learning modules were presented to students in face-to-face class meetings using presentations, examples, guided practice, and group

activities. Previous course offerings and faculty feedback had indicated that it was more appropriate to provide in-class presentations and hands-on activities to assist students in understanding these concepts. In addition, students in the research course requested and at times insisted that face-to-face classes were necessary to discuss these topics.

Qualitative structured survey responses revealed that 89% of the students stated they benefited from the “balance” between face-to-face and online instruction. Ninety percent of the students stated that using online technology would enable them to conduct reference searches more efficiently than traditional research methods such as library sessions. Several students’ emails indicated that while many of the learning activities were a good fit for online education, they also needed the face-to-face interaction to understand the more “complicated” concepts. Student verbal and written feedback on the correlational analysis and test of significance learning modules revealed that some students would have preferred more face-to-face interaction and hands-on activities to gain a better understanding of how to use and interpret these statistical methods.

Student performance measures revealed a high level of understanding and comprehension of the research in education content. The average test scores for three online and two face-to-face exams was eighty-five percent. The majority of students’ mid-term and final exam work products were above average to superior quality. Students stated that they felt less anxious and more confident after completing the work products. Overall, teachers’ attitudes towards research improved and the blended face-to-face/online format appears to be an effective way to help teachers successfully learn research methodologies and practices.

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