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Relationship Between Course Length and Graduate Student Outcome Measures

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Abstract

One method to increase flexibility in class offerings is through the use of compressed courses, classes that have the same number of contact hours but over a shorter time period (e.g., 8 weeks vs. 15 weeks). Before offering these courses, it is important to determine whether they lead to equivalent or better student outcomes. This study examined 11 traditional-length and 8 compressed sections of the same graduate-level statistics course. Results indicated students in the compressed class scored significantly higher on both the third exam and final course grade. Student course evaluations were also significantly higher in the compressed courses. Graduate students rated traditional-length and compressed courses similar in difficulty. Implications for course offerings are discussed.

Keywords

course length, graduate instruction, student learning

Higher education institutions are examining traditional format courses for any changes that could attract and retain more students (Davies, 2006; Reyes, 2010). Students who are older, working, married with dependents, and/or attending part-time are more likely to take courses offered through nontraditional methods, such as distance education, than traditional, nonworking, unmarried with no dependents, and/or full-time students (National Center for Education Statistics, 2011). Graduate students are more likely to fit the nontraditional profile and may be more attracted to nontraditional methods. Of the many possible changes to course delivery, compressed courses is one of the more common.

For this article, courses that meet fewer weeks than a full semester term (14–16 weeks) but deliver the same number of contact hours as a full-term course are referred to as compressed. Compressed courses have been commonly used in summer programs and sometimes in intersessions (Laves, 2010). A few institutions offer their entire schedule in compressed sessions (e.g., Colorado College, Cornell College); however, the use of compressed courses is becoming more popular during the regular spring and fall semester (Reyes, 2010).

Few studies have been done on the use of compressed courses in graduate school settings (e.g., Krug, Dickson, Lassiter, & Vassar, 2016), and many of them are older (Austin, Fennell, & Yeager, 1988; Barclay, 1990; LaFountain, 1995). Not surprisingly, there is a call for more research on the use of compressed courses with graduate students (Davies, 2006). Compared to undergraduates, graduates may be more mature in terms of both age and educational experience. This additional maturity may minimize classroom environmental effects on learning such as course compression.

Several studies examined student and/or faculty attitudes toward compressed courses. Adult learners in compressed courses tended to endorse compressed courses as serving their needs (Anastasi, 2007; Kasworm, 2001; Richmond, Murphy, Curl, & Broussard, 2015). Laves (2010) discovered undergraduate students, graduate students, and their instructors found a 3-week intensive summer course to offer "positive relationships between teaching presence, perceived learning, and sense of community" (p. 148). Faculty members who taught undergraduate and graduate students reported increased satisfaction in teaching summer courses and reported feeling "they are able to establish rapport with students more quickly in compressed courses (74.7%) and that students are more focused on learning outcomes (64.5%), that students participate more in class discussions (62.3%), [and] that students attend more regularly (69.7%)" (Kretovics, Crowe, & Hyun, 2005, p. 47). However, Krug, Dickson, Lassiter, and Vassar (2016) found that graduate students had more negative attitudes toward minimesters compared to undergraduates. Also, Barclay (1990) found no significant difference in graduate student attitudes about an early childhood reading course between two compressed course styles and a traditional-length course.

A review of the literature on compressed courses offers mixed results on overall student performance. In a set of

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undergraduate criminal justice courses, Hicks (2014) found no differences in grade distribution between 15-week and 8-week courses. Geltner and Logan (2001) examined 414,076 students enrolled at a community college over 4 years for differences in student success between 16-week semester courses and 6- or 8-week semester courses. In general, they found students had a higher percentage of passing courses in shorter semesters, had a higher average grade in shorter semesters, and tended to withdraw from class less in shorter semesters. Anastasi (2007) found an increase of 2–4% in final course grades in three different psychology courses in compressed classes compared to traditional-length courses. More recently, Richmond, Murphy, Curl, and Broussard (2015) found higher academic performance in two different studies across 6 psychology sections (Study 1) and 12 psychology sections (Study 2) in a variety of psychology courses for a 2-week compressed course versus a traditional-length course.

However, of the limited research conducted at the graduate level, most have found no difference in performance between graduate students in compressed and traditional-length courses. Austin, Fennell, and Yeager (1988) explored the relationship between three styles of compressed course versus traditional-length courses in a graduate program for nontraditional students. They found no significant differences in student achievement between any of the four course styles. Similarly, Barclay (1990) found no significant difference in graduate student use of strategies between two compressed course styles and a traditional-length course. Also, no significant differences in long-term retention were found between graduate counseling students who took the traditional-length course and those who took a compressed summer course (LaFountain, 1995).

Several studies have also examined the effects of covariates on the relationship between course length and student success (Davies, 2006; Geltner & Logan, 2001; Rayburn & Rayburn, 1999; Reyes, 2010) with mixed findings. One covariate that has these mixed findings is students' age (Davies, 2006; Geltner & Logan, 2001). In a review of literature on course length research, Davies stated that many examinations of achievement outcomes of compressed versus traditional-length courses are confounded with students' age, where younger students are taking the traditional-length course and older students the compressed course. In an examination of more than 414,000 community college students, Geltner and Logan found students at almost all ages to have higher passing rates, lower withdrawal rates, and higher average grades in compressed courses rather than traditional-length courses. Some potential covariates that have been found not to have a significant effect on the relationship between course length and student success include gender, grade point average (GPA), class size, time of day course is offered, probationary status, ethnicity, and English as a Second Language (ESL) status (Geltner & Logan, 2001; Rayburn & Rayburn, 1999; Reyes, 2010). Both Davies (2006) and Wlodkowski (2003) noted that more research needs to be conducted in which potential covariates are constrained in the comparisons.

Minimal research has been done on the effect of course length on graduate student achievement in the field of education/behavioral sciences. Even less research has been done on the effect of course length on graduate student satisfaction as measured by course evaluations. The purpose of this study is to examine the effect of course length on graduate student outcome measures, both achievement and satisfaction, in a master's-level statistics course.

Method

Sample

The statistics course examined is one of four courses required for all master's degrees in the College of Education at a medium-sized public regional university. The class has very similar content to an undergraduate psychology statistics class and is taught by the educational psychology faculty. Statistics is new for most of these students as they typically had not had an undergraduate statistics class. All classes selected for this study were taught by the same professor between 2006 and 2012, using the same methods, pacing, and content, including lectures, exams, and course materials. The traditional-length and compressed classes were taught throughout those years.

To control for possible differences in graduate student ability between those enrolling in traditional-length courses and those enrolling in compressed courses, only students whose graduate-level GPA could be calculated through unofficial transcripts prior to taking the statistics course were included in the analysis of student performance. Of the 338 who completed the graduate statistics course, 253 students met the qualifications to participate in the student performance portion of the study. Because student course evaluation submission is anonymous, we could not directly link a student's performance with their course evaluation. Therefore, we analyzed data from the course evaluations separately. Of the 338 students, 313 participated in the course evaluations.

Instructors taught classes in the traditional-length semester in the spring or fall once a week for 3 hr. Instructors taught classes in the compressed semester in the summer twice a week for 3 hr (8-week classes) or 3 times a week for 4 hr (4-week classes). From the graduate student performance sample, 153 students in 11 sections were enrolled in traditional-length semesters and 100 in 8 sections in compressed semesters. The mean class size was 20 (range of 3–28) students in traditional-length semesters and 15 (7–21) students in compressed semesters. The average age of graduate students was 34.5 (range of 23–59) in the traditional-length semester and 34.5 (23–55) in the compressed semesters. From the student evaluation sample, 166 students attended the traditional-length semesters and 147 attended the compressed semesters.

Measures

Each graduate student took the same three instructor-created exams, worth 25 points per exam. These three exams plus 25 points for homework and up to 5 points for participation/extra credit formed the final class score. Student evaluation scores were collected anonymously from each student near the end of

Table 1. Differences in Student Performance in Traditional-Length Versus Compressed Semesters.

Performance Measure	Traditional-Length	Compressed	*F*	*p*	Partial η^2
Exam 1	20.39	20.43	0.19	.67	.001
Exam 2	20.74	20.93	0.00	.96	.000
Exam 3	18.78	20.10	5.97	.02	.023
Final course grade	86.27	90.16	10.90	.001	.042

the semester. Students rated course difficulty, course workload, and course pace on a 1 (*very easy*, *very light*, or *too slow*) to 5 (*hard*, *very heavy* or *too fast*) Likert-type scale. Students also rated 22 questions concerning the instructor's behaviors (e.g., "instructor provided a well-organized course") on a 1 (*very poor*) to 5 (*very good*) Likert-type scale.

Results

The initial analysis of differences between the compressed and traditional-length classes on the covariates found nonsignificant differences in previous GPA and student age, both *p*s > .05 (partial $\eta^2 = .004$ and .000, respectively) and a significant difference in class size, $F(1, 251) = 53.84$, $p < .001$, partial $\eta^2 = .177$. Thus, in the follow-up Analysis of Covariance (ANCOVAs), class size was the only covariate used.

For the four follow-up ANCOVAs, the covariate of class size was not significant for any of the analyses on graduate student performance, all *p*s > .05. Two of the four analyses (Exams 1 and 2) did not show any significant differences between students who enrolled in compressed courses versus those enrolling in traditional-length courses (see Table 1). However, on both Exam 3, $F(1, 250) = 5.97$, $p = .015$, partial $\eta^2 = .023$, and the final class score, $F(1, 250) = 10.9$, $p = .001$, partial $\eta^2 = .042$, graduate students taking the compressed courses scored significantly higher than those taking traditional-length courses by about 4–5%.

On the course evaluations, no significant differences were found between graduate student evaluations in the compressed versus traditional-length courses for course difficulty, course workload, and course pace, all *p*s > .05. For questions relating to instructor performance, 17 of the 22 statements were significant. In all cases, graduate students perceived the instructor performed better in the compressed classes. Effect sizes tended to be small- or medium-sized (average Cohen's $d = .26$).

Discussion

In this study, graduate students earned higher grades in the compressed semester than the traditional-length semester. This difference appeared more at the end of the semester than toward the beginning. This difference occurred even though the instructor taught the classes in the same manner with the same assignments. In addition, these differences could not be accounted for by several other factors including the students' prior GPA and class size. Additionally, students did not perceive a difference in the course difficulty or pacing. Furthermore, in the compressed semester, graduate students tended to rate the instructor higher on many different attributes indicating more satisfaction with the instructor. From this study, it appears there are several advantages to classes taught using a compressed semester including better student performance and higher student satisfaction with the instructor.

Our findings demonstrate that the difference in graduate student performance occurs toward the later part of the statistics class. One possibility for this finding could be students more likely experience effects of not remembering previous classes later in the semester rather than earlier. Forgetting information from a single class earlier in the semester may not be problematic, especially since topics earlier in the semester are easier to understand. However, by the end of the semester, any forgetting is compounded. This compounding, coupled with the increased difficulty, could lead to the greater decrements in performance over time observed in our data.

Graduate students did rate the instructor higher in compressed classes on a variety of attributes including providing clear explanations of content, providing stimulating materials, and fairness in evaluating progress. We would caution against putting emphasis on which specific attributes were significant and which were not. As with many course evaluations, there is the likelihood of a halo effect such that when an instructor is rated high on one item they are rated high on other items as well (Darby, 2007). One possibility is since students performed better in the compressed semesters, they partially attributed this higher performance to higher instructor quality and gave higher ratings. Similarly, if the student did not do as well in the traditional-length semesters, the student might rate the instructor lower in quality. Another possibility is that compressed courses could enhance student–instructor rapport (Kretovics et al., 2005; Richmond et al., 2015).

There are several limitations to this research. First, all the traditional-length sessions took place during the traditional-length fall or spring semesters and all compressed sections took place during the summer session. Also, all traditional-length classes met only once a week and compressed sections met more than once a week. These confounds could have affected our results. For example, there could be fewer outside-of-class distractions during the summer. A second limitation is that this study focused on one instructor at one university. Student evaluations were high for the instructor in both conditions. It is unclear whether the effect we found would be different with an instructor who received more mediocre ratings. Finally, it is unclear whether higher student performance in the compressed sections would lead to long-term knowledge retention (Daniel, 2000).

We demonstrated an advantage for compressed classes for graduate students in this instance while ruling out several possible alternative explanations. Based on our findings, faculty of master's level psychology programs, especially those that serve nontraditional students, may want to explore using compressed classes either in summer or within a long semester. Unlike previous research on graduate students, we found positive effects on both student class performance and teacher ratings. These results match with more recent research on undergraduate psychology classes (Anastasia, 2007; Richmond et al., 2015).

In the future, it would be useful to attempt studies in which stronger causal conclusions could be made (e.g., having compressed and traditional classes within the same semester and randomly assigning studies). Studies which also measured learning well after the end of the semester would enhance the idea that length of semester had a long-term effect. Additionally, it would be useful to better theoretically link and test under what conditions (e.g., classes with skill acquisition) compressed classes would and would not be effective. Much of this research will be difficult to do given the applied setting. Even with these unanswered questions, we currently find that the use of compressed classes may have positive effects and could be a tool for psychology faculty and programs wanting to meet the needs of nontraditional graduate students.

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