An Evaluation of Student Outcomes by Course Duration in Online Higher Education

Melanie Shaw, Ph.D.
Northcentral University
mshaw@ncu.edu

Barry Chametzky, Ph.D.
Washington and Jefferson College
barry@bluevine.net

Scott W. Burrus, Ph.D.
Northcentral University
sburrus@ncu.edu

Kelley J. Walters, Ph.D.
Walden University
kelley.walters@waldenu.edu

Abstract

To facilitate student learning and ensure financial stability, leaders in higher education institutions offering online degrees and programs are adopting flexible course schedules with shorter terms. The literature does not include many evaluations demonstrating how shorter duration terms and courses might affect student achievement. In this quantitative study, data were gathered from six online courses. While the courses were identical in content and number of assignments, half were taught in a 16-week format while the others were taught in an 8-week format. Results show there was no statistical difference in student achievement or engagement between either course duration. These results are potentially encouraging for institutions looking to offer shorter duration courses to meet student enrollment needs and student preferences. Accelerating the number of courses a student can complete by shortening the duration of the term also benefits the institution by facilitating financial stability. Recommendations for further study include examining graduate and doctoral courses as well as face-to-face courses to ensure that results are generalizable to those contexts.

Introduction

Courses offered in distance learning formats exponentially increased in popularity over the past few decades (Allen & Seaman, 2009, 2010, 2013; Green, Alejandro, & Brown, 2009; Langen, 2011). According to the National Center for Education Statistics (2011):

> Distance education courses and programs provide flexible learning opportunities to both undergraduate and post baccalaureate students. In this indicator, distance education courses include live, interactive audio- or videoconferencing; prerecorded instructional videos; webcasts; CD-ROMs or DVDs; or computer-based systems accessed over the Internet. Distance education does not include correspondence courses. (para. 2)

Currently, between 6.7 million (Allen & Seaman, 2013) and 15 million students (National Center for Education Statistics, 2012) are enrolled in distance education courses. Because of the popularity of distance learning courses, even traditional, brick and mortar institutions now provide increasing opportunities for students to enroll in online courses. With the growth of online access, universities and colleges across the country have risen to meet consumer demand for online programs (Allen & Seaman, 2013; Song, Singleton, Hill, & Koh, 2004). Two-thirds of colleges and universities assert that online

education is the most significant development in higher education as it offers students flexibility and convenience (Shin & Lee, 2009). This continuous growth means an increased demand for more instructors, more training, and more continuous faculty development. The consideration of best practices is essential, especially when it comes to ideal course length.

In the traditional academic calendar, the school year is divided into fall and spring semesters lasting up to 16 instructional weeks. In addition, many universities and colleges offer a shorter summer term. Student contact hours or credits are based on the Carnegie Unit (Smith, 2012). This measurement is based on 120-144 hours of contact including instructional time, laboratory hours, studying, and homework time. While the Carnegie Unit was originally based on a minimum of 16 weeks, today, colleges and universities use these contact hours based on the total 120-144 hours to quantify the amount of work required in a course (Carnegie Foundation, n.d). Intensive or "massed" (Ferguson & DeFelice, 2010, p. 75) courses are not new to post-secondary education; such courses have been in existence for over 100 years (Seamon, 2004). With the advent of online education and possible budgetary constraints; however, school administrators may use shortened semester courses, i.e. 8-week courses—along with spaced (Anastasi, 2007; Scott & Conrad, 1991, p. 10) or "distributed" (Ferguson & DeFelice, 2010, p. 75) courses as a way to gain additional revenue. In a study of diverse course activities in online classes, Shaw, Walters, and Long (2013) noted the majority of online courses lasted 15-16 weeks (40.4%); however, other courses spanned 1-2 weeks (7.2%), 3-4 weeks (13.9%), 5-6 weeks (21.7%), 7-8 weeks (30.1%), 9-10 weeks (24.7%), 11-12 weeks (28.9%), 13-14 weeks (7.8%), and longer than 16 weeks (4.2%).

Online instructors are challenged to implement meaningful course engagement, regardless of term length, in order to help students acquire new skills and demonstrate mastery of course content. For this quantitative, correlational study, the researchers gathered data to determine if there was a between group difference between course duration type (8 vs. 16 week term length) and student achievement as evidenced by course participation via assignment completion and final grade. In this study, the researchers undertook an evaluation of an undergraduate, standardized course in abnormal psychology taught in an online setting. Three sections of the courses were taught in an 8-week format and the other three sections were taught in a 16-week format. All six sections of the course were taught by the same instructor, with the exact same content in each section. Weekly assignment, discussion, and exam grades were tabulated to determine which group of students performed better on final grades and total assignment completion rates– those enrolled in 8 or 16 week courses.

Problem Statement

Colleges and universities operate on varying school calendars with course lengths ranging from several months to just a few days. Course scheduling is not only a financial and operational consideration, but may also be tied to student engagement and achievement. Despite the variety of course lengths available to students, little research has been done to understand whether course length relates to student academic success. The Carnegie Unit was developed in 1906 to quantify student contact hours in a course (Carnegie Foundation, n.d.). This measurement has been the basis for scheduling used by many institutions of higher education. Without knowledge of optimal course length, higher education leaders will be unable to plan course offerings based on the highest potential for student learning and will instead continue to rely on the Carnegie Unit as the primary basis of course length. Students who complete lengthy courses may become disengaged and drop out, while those who complete relatively short courses might not master curricular content. Further, institutions may profit from shorter courses and be able to provide more course offerings per calendar year. Since student success and financial strength are vital concerns, data regarding optimal course lengths are essential to the future of online higher education (Association of American Colleges and Universities, 2013).

Purpose Statement

The purpose of this quantitative, correlational study was to explore the relationship between course length and student achievement. Data from this study were used to understand the optimal duration for online higher education courses. Because of the wide variety of course lengths offered, data were gathered to determine if student outcomes were affected in an 8-week versus a 16-week course format. Six sections of an undergraduate, abnormal psychology course (3 in an 8 week format and 3 in a 16 week format)

taught online by the same instructor were used for this study. The courses were taught at a community college in the Midwest. Data from all assignments, discussions, and exams were gathered from 115 students over four different semesters from the Fall semester, 2011 through the Fall semester, 2012. The research variables used in the study were course duration, student achievement (final score), and assignment completion. There were a total of 18 assignments in each class.

Research Questions

There were two research questions used in this study. Both questions required a quantitative, correlational analysis. The research questions guiding this study were:

Question 1 – Is there a relationship between course length and student achievement?
H10 – There is no relationship between course length and student achievement.
Question 2 – Is there a relationship between course length and assignment completion?
H20 – There is no relationship between course length and assignment completion.

Literature Review

From the perspective of the learner or the educational researcher, it is not straightforward to discuss the benefits and disadvantages of shorter or accelerated semester courses for numerous third variable issues come into play. Such variables include, but not limited to, internal or external motivation, self-efficacy (Seamon, 2004), learning style, learner profile (traditional or nontraditional student), and level of anxiety to learn the technological tools and do the work in a fast-paced environment.

While a correlation between term length and learner success might be evident in some environments, such a correlation is not present in all situations (Carrington, 2010) thereby causing potential generalizability issues. Further, educational and psychological researchers have interpreted the literature in the fields of education and psychology with mixed results (Carrington, 2010). "The best that a person might say is that studying data from various analyses and instruments in one learning [situation] might yield certain results given the presence of a number of conditions" (Chametzky, 2013, p. 38).

In order to make a determination one way or another, two questions must be asked. The two questions are: What are the short-term objectives of accelerated and traditional-length courses? What are the long-term objectives of accelerated and traditional-length courses (Seamon, 2004)? Yet, not all educational theorists have asked these questions. By better understanding the answers, educational researchers would be more easily able to understand the benefits and disadvantages of short-term versus long-term length vis-à-vis student outcomes.

Benefits of Condensed Courses

Greater "social presence" exists in shorter-term courses compared to traditional 16-week courses (Garrison & Akyol, 2009, p. 24). Because of the intense, continued opportunities (Lee & Horsfall, 2010) learners have to interact with course members, learners have more occasions for "deeper learning" (Nation, 2007, p. 5) with peers and with educators. The heart of these more profound learning opportunities comes from learners who are actively engaged participants in the course (Svirko & Mellanby, 2008). Ferguson and DeFelice (2010) have clearly indicated that students enjoyed peer interaction during condensed courses more than in the traditional-length courses.

Along with these moments of greater cognition, faculty feedback occurred faster in compressed courses than in full-length semester courses (Lee & Horsfall, 2010). Such interaction during compacted courses (Sheldon & Durdella, 2010) could possibly lead to a greater rapport that students generally experienced with faculty. The combination of intense focus (Anastasi, 2007) and interaction is necessary in order to increase and to support motivation and achievement (Kucsera & Zimmaro, 2010; Lee & Horsfall, 2010). With compressed courses, too, learners might be able to see progress toward completion of their degree more quickly. Bowen, Chingos, and McPherson (2009) commented that when learners are able to make faster progress toward their degree, the likelihood that they will complete the program is greater.

In an online environment, with increased faculty-student interaction, students feel less isolated

(Chametzky, 2013). With a reduced feeling of isolation, it might then be possible to reduce levels of anxiety feelings of overwhelm (Guertin, 2010; Pino, 2008). With such a reduction in stress and discomfort, cognition would increase and greater self-efficacy (Saadé & Kira, 2009) would occur.

Satisfaction with the accelerated courses was also an important factor in learner benefits. In their study, Ferguson and DeFelice (2010) found a higher degree of fulfillment and enjoyment among students. Such student satisfaction translated to higher grades in shortened semesters (Anastasi, 2007). In fact, students preferred shortened courses to the more typical semester-length courses (Ho & Polonsky, 2012). Whether because courses were indeed easier or just perceived to be so (Anastasi, 2007), a benefit of compressed courses aids in maintaining self-efficacy (Hodges, 2008; Liaw, 2008), the belief that a student could produce the desired results. The result, then, is a kind of self-fulfilling prophecy where students think the course is easy and they like it so they work harder resulting in higher grades.

Educational researchers have conducted a study examining performance of learners in accelerated courses (Sheldon & Durdella, 2010). The population for the study was from a two-year post-secondary suburban school for a three-year period from 1998 through 2001. Data from students who took "at least one developmental English, reading, or math course" (Sheldon & Durdella, 2010, p. 45) proved valuable. Sheldon and Durdella (2010) determined that student success rates were higher in accelerated courses than in traditional courses. "Students, irrespective of age, gender, and ethnicity, were more likely to successfully [sic] complete developmental courses offered in a compressed format than their counterparts enrolled in regular-length developmental education courses" (Sheldon & Durdella, 2010, p. 50).

The benefits of shorter-term courses for educational institutions should be evident. The biggest advantage is producing graduates more quickly than via traditional-length courses (Schoenfeld, 1967). Producing graduates at a more rapid rate means more available seats for new students. In addition, if a higher education institution could offer more courses, the potential for additional revenue (Edgecombe, 2011) through tuition and incidental fees is greater.

Disadvantages and Challenges of Shorter Term Courses

In an online environment, learners need to be able to use the required technology. Given that the working memory of people, according to Miller's (1956) cognitive load theory, only 7 +/- 2, in an accelerated online environment, learners might need to address many more than five to nine issues simultaneously. In such a situation, cognitive overload (Cook, 2012) would occur resulting in isolation and withdrawal (Chametzky, 2013). Anderson and Anderson (2012) determined that extra time in a course increased students' performance. Given the increased stress and anxiety very possibly caused by online classes (Chametzky, 2013; Majid, Othman, & Rahmat, 2007) as well as the compounded anxiety because of the shortened semester, cognition is decreased (de Jong, 2010; I-Jung & Chi-Cheng, 2009). In his 2013 study, Chametzky found that a hierarchy of needs, à la Maslow, occurred. Learners in online foreign language courses needed to reduce anxiety before their cognitive needs could be addressed. The anxiety might manifest itself in subtle ways such as more negativity toward technological tools (Liaw, 2008), decreased motivation and self-efficacy (Hodges, 2008). Without addressing anxiety, cognition cannot adequately happen. In a shorter-semester course, unless learners are well versed in the technology and confident in the subject matter, anxiety could easily increase.

For the administration of a post-secondary school, one potential downside to reduced semester lengths might be a "water[ing] down" (Weeber, 2011, p. 5) of the workload required. In other words, are the standards of the institution and the course being upheld in shortened-term courses as they are in longer-term courses? A parallel might be made between studying for a major exam a little each night versus cramming for three hours the night before. In one situation, the result is less optimal than the other. Therefore, it is reasonable to ask whether the grade of A earned in a shorter-term course has the same value as a grade of A earned in a full-length course (Seamon, 2004)? The answer to this question depends on numerous factors including confounding factors (Kucsera & Zimmaro, 2010) and is not easily answered (Kucsera & Zimmaro, 2010 referencing Scott & Conrad, 1991 [unavailable]).

Data Regarding Outcomes

Carrington (2010) explained that the variable of subject matter has an effect on the correlation between

student success for traditional post-secondary students and semester length. With a "chi-square statistic of 47.602 [for an Intermediate Accounting class] . . . there is a significant association between course schedule and course grades" (Carrington, 2010, p. 54). For nontraditional learners, however, Carrington (2010) found no such significance. As such, the association that might exist for traditional learners is absent for nontraditional learners.

In the study conducted by Seamon (2004) during the summer and fall semesters of 1999 at a mid-Atlantic university, he also found important, valuable results. Through analysis of pre- and posttest data (for short-term and long-term retention of material and ANCOVA tests, Seamon (2004) found that students in intensive courses fared better in the short-term than those in semester-length courses. However, the results were different when examining long-term retention. For students who took compressed courses, "in post-testing three years later the full-semester students outperformed the intensive course students" (Ferguson & DeFelice, 2010, p. 75). In the study conducted by Anastasi (2007) of 506 students at Arizona State University who took various psychology courses, he found that "student performance was not poorer for abbreviated summer courses compared to the same courses taken during a regular-16-week semester" (p. 21).

Methodology

A quantitative, correlational or associational analysis was conducted to determine if course length was related to student achievement or assignment completion in six abnormal psychology courses. These six courses were identical, with the exception of the course duration. The courses were taught online using Blackboard Learning Management System. The abnormal psychology course required no instructor grading other than assessing participation in discussions and completion grades for two assignments. Students completing these discussions and assignments received full credit for completion or no credit if the assignment was not attempted. Other assignments and exams were automatically scored by Blackboard after student completion. There were a total of 18 assignments for students to complete in each abnormal psychology course.

Correlational research was selected to study the relationship among the variables (course length, student achievement, and assignment completion). Correlational research allows for a description of existing relationships (Fraenkel & Wallace, 2003). Because the researchers were interested in understanding how course duration influences student outcomes and assignment completion, this method was an appropriate choice.

Participants

Data from 115 students were used in the study. Scores included discussion participation, assignments, self-graded quizzes, and exams. There were a total of 18 possible scores reviewed for each student. The study was limited to students enrolled in one of two course formats for abnormal psychology at the undergraduate level. This course is required of all students who have selected psychology as a major for their associate's degree. Introductory psychology is a prerequisite course for students to have completed prior to enrolling in the abnormal psychology course. The courses totaled 1000 possible points. Courses were offered in both 8 and 16-week formats.

Results

For this study, a one-way between groups analysis of covariance was conducted to compare student participation and achievement outcomes between those in 8 and 16 week course terms. The independent variable was course length, and the dependent variables were the students' final course score and the average number of assignments out of a total of 18 possible assignments in the course. Gender was used as a covariate to account for potential gender differences. Data were examined to ensure no violation of common statistical assumptions. After controlling for gender, there was no significant differences between course term length and final score ($F(1, 112) = .05$, $p = .82$) or assignment completion $F(1, 112) = .06$, $p = .80$).

Table 1

Descriptive Statistics

Group	Sample	*M* (*SD*) (assignments completed)	*M*(*SD*) (final score)
8-week term	*n*=57	15.6/3.2	763/191
16-week term	*n*=58	15.5/2.9	756/165

Discussion

For this study, two research questions were used to evaluate if there were differences in student achievement based on final scores earned in the course and total assignment completion rates. To answer both questions, researches used a quantitative, correlational analysis. The research questions were as follows:

> Question 1 – Is there a relationship between course length and student achievement?
> H10 – There is no relationship between course length and student achievement.
> Question 2 – Is there a relationship between course length and assignment completion?
> H20 – There is no relationship between course length and assignment completion.

An analysis of the results reveals that there the null hypothesis must be accepted for both research questions. There was no statistical difference in student outcomes in terms of final score or assignment completion for students enrolled in 16 versus 8 week courses. After controlling for gender, there was no difference in how many assignments were completed per student. In addition, there was no difference in the final course grade earned out of a possible 1000 points for the course.

Because this course had a prerequisite (introductory psychology) and was a required course for psychology majors in the associate degree program, students in this course had some previous college experience prior to enrolling in these abnormal psychology courses. In addition, the majority of the students (80%) had taken an online course previously, so they were familiar with the format of the course and the learning management system used. All grades were either earned through multiple choice, self-scored exams and assignments or through instructor grading on completed assignments. Because the instructor was not required to enter any subjective grades, as the student earned full points for completion or zero points for non-completion, instructor influence in study was not considered an extraneous variable. Because a single course in one subject area was used, limitations in generalizability exist beyond the scope of this undergraduate, community college setting. There was no consideration of age or other demographic factors (besides gender), which might have influenced the results.

Conclusion

There is compelling literature on both sides of the course term length issue. Based on the results of this study, the researchers can assert that both 8 and 16 week course options provided similar learning experiences for students in terms of content given, scores earned, and total assignments completed. What is not at all evident from the literature is whether generalizability is possible. In some situations, traditional-length terms might yield better assessment results than shorter-length courses. If research informs practice, though, enough data exist to support compressed courses. Yet, before administrators and educational theorists view this as a carte blanche for shorter-term courses, it is vital to understand clearly the objectives of learners and of school administrators. Depending on these objectives, compressed courses with more frequent class sessions (Spurling, 2001) might or might not be valuable. Further research should be conducted to conclusively advocate for compressed or traditional course term lengths, but based on this study, it is evident that students were equally successful in both formats.

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