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Do Compressed In-Person Classes Yield Student Performance Results Comparable to Traditional 16-Week In-Person Classes?

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Institutions of higher learning are offering an increasing number of compressed in-person classes with the goal of providing to their diverse student populations flexibility of instruction delivery. Southern Illinois University (SIU) and many other colleges are offering an increasing number of classes with compressed schedules to increase student enrollment (Krug et al., 2015). The increase in the number of compressed classes presents the challenge of ensuring that the same academic rigor and breadth of knowledge are maintained in comparison to the traditional 16-week semester. Therefore, it is necessary for the compressed courses to provide the same student learning outcomes and cover the same course material, requiring faculty to use the same textbooks and course content. The purpose of this research study was to determine any variance in overall student academic performance after two groups of undergraduate students completed the same course taught in two different modalities, as indicated by comparing students' final course grades. This study compared the performance of two groups of undergraduate students enrolled in the same Southern Illinois University (SIU) course that was delivered in two different modalities. An independent samples t-test was conducted in SPSS to determine if there was a significant difference between the on-campus and off-campus classes' final course grades. There was no significant difference found between the on-campus and off-campus classes. These results suggest that the delivery formats of the course, traditional 16-week format or compressed off-campus weekend format, did not result in meaningful differences in the final course grades for the participating classes.

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Institutions of higher learning are offering an increasing number of compressed in-person classes with the goal of providing to their diverse student populations flexibility of instruction delivery. Flexibility of instruction provides course schedules and formats that meet the needs of a diverse student population. This depends upon the institution of higher learning to provide the courses the students need, at the time the students need them, and in the desired modality (Kelly, 2008). Compressed courses are offered during a reduced schedule in comparison to the traditional 16-week college semester. Such arrangements provide students with increased flexibility by allowing the students to complete three eight-week classes, one after the other. It allows the student to concentrate on fewer courses at one time during the semester. Some students have life challenges, such as work and family obligations, and flexibility of instruction delivery can help students overcome some of these challenges.

The compressed courses offer the same number of student contact hours as the traditional 16-week courses. Therefore, it is necessary for the compressed courses to provide the same student learning outcomes and cover the same course material, requiring faculty to use the same textbooks and course content. In addition, compressed courses must require students to complete comparable student performance assessments such as writing-based assignments, quizzes, and examinations (Choudhury, 2017).

Statement of the Problem

Southern Illinois University (SIU) is accredited by the Illinois Board of Higher Education (IBHE). The Aviation Management (AVM) program is reviewed by the IBHE on an eight-year cycle (SIU-Provost and Vice Chancellor for Academic Affairs, n.d.). Because the AVM undergraduate program has two modalities, on and off-campus, SIU must provide evidence that assessment will be consistent across both modes of delivery and all locations (SIU- Provost and Vice Chancellor for Academic Affairs, n.d.).

SIU and many other universities are offering an increasing number of classes with compressed schedules to increase student enrollment (Krug et al., 2015). The increase in the number of compressed classes presents the challenge of ensuring that the same academic rigor and breadth of knowledge are maintained in comparison to the traditional 16-week semester. As an increasing number of students pursue classes with compressed schedules, it is difficult to ensure that these students are receiving the same quality of education as students who pursue a traditional class format. One method to validate the parity of the two modalities is to evaluate student performance. For this reason, it is necessary for the AVM program to compare student performance at the SIU AVM off-campus locations with those AVM students at the SIU main campus in Carbondale, Illinois.

Purpose of the Study

The purpose of this research study was to determine if students enrolled in off-campus classes with compressed schedules were receiving the same quality of instruction as students enrolled in traditional on-campus 16-week courses. This study compared the performance of two groups of undergraduate students enrolled in the same SIU course that was delivered in two different modalities. Data was collected from students enrolled in the *AVM 305: Aviation Industry Career Development* course taught in the traditional 16-week classroom setting on the SIU main campus in Carbondale, Illinois, and from the students enrolled in the off-campus compressed course taught at the Community College of Beaver County in Monaca, Pennsylvania. The courses used the same curriculum and were taught by the same instructor. The data consisted of course grades associated with student performance assessments.

Research Question

The following research question and stated hypotheses were addressed by collecting and analyzing performance assessment data from undergraduate students enrolled in SIU AVM coursework:

RQ: Is there any variance in overall student academic performance after two groups of undergraduate students complete the same course taught in two different modalities, as indicated by comparing students' final course grades?

a. Null Hypothesis *(H0)* - There is no variance in overall student academic performance, as indicated by students' final course grades after two groups of undergraduate students complete the same course taught in two different modalities.

b. Alternative Hypothesis *(H1)* - There is a statistically significant variance in overall student academic performance, as indicated by students' final course grades after two groups of undergraduate students complete the same course taught in two different modalities.

Significance of the Study

Research has compared the performance of students enrolled in compressed and traditional in-person classes (Sheldon & Durdella, 2010). However, no research has specifically analyzed the performance of students enrolled in an aviation management-related class offered in a traditional on-campus 16-week format as opposed to an off-campus six-week compressed schedule. The research is unique because it uses the same instructor, class lectures, assessments, and other course materials. The course format, compressed or traditional, is the only difference between how the two courses are delivered to the students. Moreover, the sample of students enrolled in each format is homologous as they are primarily traditional college students. The findings of this study will determine if students are receiving the same educational experience when completing the same class using two different modalities, on and off-campus.

Limitations

This study is limited based upon the voluntary participation of two groups of collegiate aviation students. One group consisted of collegiate aviation management students located at the SIU main campus in Carbondale, Illinois. The other group consisted of collegiate aviation management students located at an off-campus location at a community college in Pennsylvania. In addition, this study is limited by certain uncontrollable variables that cannot be accounted for, such as student motivation, commitment, and academic aptitude.

Literature Review

Many institutions of higher learning are offering more courses with compressed schedules to increase student enrollment (Krug et al., 2015). The compressed course format appeals to students who want to earn a college degree but cannot commit to the traditional course format due to family and work commitments (Krug et al., 2015). It is believed that compressed courses increase student retention, and student retention is needed to increase graduation rates. In 2019, almost two-thirds of jobs in the United States required a postsecondary degree or certificate (Bustamante, 2019). Compressed courses provide students with increased flexibility in comparison to traditional courses taught in a 16-week semester. Moreover, the compressed course schedules also allow students to reduce the time needed to graduate. In 2019, it took students in the United States an average of 52 months to complete a bachelor's degree (Bustamante, 2019). Furthermore, a study has indicated that students prefer compressed courses over traditional courses (Williamson, 2017).

Advantages & Disadvantages of Compressed Courses

Questions have been raised by the collegiate academic community regarding the relationship between course length and course success. Do students enrolled in compressed courses perform as well as those enrolled in traditional 16-week courses? Do students enrolled in compressed courses simply memorize the material quickly and perform well on examinations due to the benefits of short-term memory? Overall, student academic performance must be examined to determine if there is any variation between student success in the two-course formats.

There are many advantages associated with compressed courses. First, compressed courses provide flexible schedules that work best with the schedules of non-traditional students. Non-traditional students are those individuals who are over 24 years of age. This demographic is increasing as non-traditional students now account for approximately 40% of all college students in the United States (Battiste, 2022). According to the National Center for Educational Statistics, 73% of students enrolled at institutions of higher learning are considered non-traditional students (Battiste, 2022). This statistic is based upon a broad definition of a non-traditional student that includes characteristics such as employment and financial status. As stated earlier, institutions of higher learning are trying to attract and recruit a growing population of non-traditional college students. Institutions are trying to accomplish this goal by offering flexible hours to attend classes and rethinking the delivery of degree programs to accommodate those non-traditional students who have jobs (Battiste, 2022). Carman & Bartsch (2017) and Anastasi (2007) list other

advantages to compressed courses: (1) the ability of students to quickly build a relationship with professors, (2) increased attendance, (3) decreased course drop rate and fewer incomplete grades, (4) increased graduation rates because the shorter duration of the course decreased the likelihood students would encounter schedule conflicts, and (5) institution's state funding is often linked to graduation rates.

There are also several disadvantages associated with compressed courses, and students need to mitigate these disadvantages to be successful in compressed courses. Krug et al. (2015) and Almquist (2015) list a few disadvantages of compressed courses: (1) some students reported increased mental and physical fatigue, (2) students can quickly fall behind in the course, and (3) not all students possess the motivation and discipline to be successful in a compressed course.

Overall, the study indicated students are more successful in compressed courses regardless of academic ability (Walsh et al., 2019). Again, the success may be attributed to students' ability to focus on fewer classes at one time and increased engagement with the instructor and their classmates. To sum up, institutions of higher learning are finding that compressed courses increase student success rates (Walsh et al., 2019).

Research on Student Performance

A study was conducted by Carnegie Mellon University that compared match-pair courses and student learning (Walsh et al., 2019). The primary difference between the match-pair courses was that one class was six weeks in length while the other was 14 weeks. The study used the final grades as the primary measure of student learning. The study also used student surveys, pre-tests, and post-tests to provide additional information. When the study used the final grades as the only indicator of student learning, the students in the compressed format performed better than their 14-week counterparts (Walsh et Al., 2019).

Several studies found that students of all ages who are enrolled in compressed classes have higher grades and lower withdrawal rates compared with students enrolled in traditional 16-week semesters (Carman & Bartsch, 2017). Several factors influenced these findings. First, the social presence of students in the classroom was more prominent during a compressed format. The students interacted more frequently with each other and the instructor during the compressed courses. Finally, students in compressed courses indicated they devoted more time and energy to their coursework (Carman & Bartsch, 2017). However, a study conducted by Brigham Young University indicated that, between the two-course formats, there was no significant difference in the amount of time students spent completing coursework outside of the classroom (Lutes & Davies, 2017).

Another study analyzed the relationship between course length and student success. Student success can be defined by varying metrics based on the goals of the student and institution of higher learning. The results indicated those students enrolled in the compressed courses experienced higher course success and completion rates when compared to those enrolled in the traditional 16-week course (Sheldon & Durdella, 2010). The results were the same when including demographic factors such as age and ethnicity. However, women were more likely to be successful in a compressed course than men, but the same results were true for

the traditional 16-week course. Non-traditional students experienced increased student success in the compressed courses (Sheldon & Durdella, 2010). Overall, students of all ages performed better in compressed courses.

Southern Illinois University

Southern Illinois University (SIU) has a high success rate in the AVM off-campus program. There are several factors that determine an academic program's success; however, the graduation rate for students is one of the most important factors. Over the last two years, the SIU AVM off-campus program has experienced a high graduation rate. The off-campus AVM students complete all the required AVM courses utilizing the compressed format. The students complete three courses during the 16-week semester; however, they are enrolled in only one class at a time. Students meet on Saturdays and Sundays, every other weekend, from 8:00 a.m. until 4:50 p.m., for six weeks.

Methodology

The purpose of this research study was to determine if students enrolled in off-campus compressed classes received the same quality of instruction as students enrolled in on-campus traditional 16-week courses. This study compared the performance of two groups of undergraduate students enrolled in the same SIU course but presented in two different modalities. The collected data consisted of course grades associated with student performance assessments.

Research Design

The research design for this study is applied research. Applied research is a scientific method of inquiry that seeks to solve a specific problem or provide solutions to issues affecting an individual, group, or society (Ayanyemi, 2023). It is crucial that a comparable quality of instruction be received by students in both modalities. Parity concerning academic rigor and breadth of knowledge must be maintained for all students.

Population & Sample

Purposeful sampling focuses on a smaller sample to allow for a comprehensive analysis rather than a larger sample, which can provide more data and accuracy (Creswell & Creswell, 2018). Data was collected from two student groups; one group was enrolled in the on-campus traditional 16-week format, and the second group of students was enrolled in the off-campus course compressed six-week format. The total enrollment for both courses was 40 students. There were 14 students enrolled in the on-campus course and 26 students enrolled in the off-campus course. The selection of the students for participation in the research was based on their fall 2021 enrollment in the AVM 305 course taught at both locations. The students were not excluded from participating based on academic level or academic status. The study did not discriminate based on gender, race, religion, or ethnicity. All the students who participated were volunteers and received no compensation for participating in the study. Key attributes for the two-course modalities are provided in Table 1.

Table 1
Attributes of Two Modalities

Attributes	On-Campus Modality	Off-Campus Modality
Location	SIU Main Campus - Carbondale, IL	Community College of Beaver County - Monaca, PA
Student Enrollment	26	14
Schedule	Traditional 16-Week Semester	Compressed 6-Week schedule
Contact Hours	48 Hours	48 Hours
Instructor	Same	Same
Curriculum	Same	Same
Course Materials & Assessments	Same	Same
Semester	Fall 2021	Fall 2021

Research Instruments

Fourteen (n = 14) on-campus and 26 (n = 26) off-campus students participated in the research study. The student performance assessment data was collected by the researcher based on course assessments and assignments, including (1) three quizzes, (2) six discussion posts, and (3) four assignments.

Data Analysis

The data analysis consisted of an independent samples t-test conducted in Statistical Package for the Social Sciences (SPSS) to determine if there was a statistical difference between the overall academic performance of the on-campus and off-campus students (Bevans, 2023).

Using a t-test establishes a null hypothesis by assuming the means of the two groups are equal (Fernandez, 2020). If the t-test rejects the null hypothesis, then there is a statistically significant variance between the groups. The p-value is the probability that you would obtain your results by chance (Fernandez, 2020). The critical value for this research study is $\alpha = .05$ and will be compared to the p-value from the t-test results:

- $p\_\text{value} > \alpha$ (.05): Fail to reject the null hypothesis of the statistical test.
- $p\_\text{value} \leq \alpha$ (.05): Reject the null hypothesis of the statistical test.

The critical value of 0.05 means that if an experiment is performed 100 times, 5% of the time, the null hypothesis will be rejected, and 95% will not.

Research Findings

The findings of the research study were analyzed to determine if students enrolled in off-campus classes with compressed schedules are receiving the same quality of instruction as students enrolled in traditional on-campus 16-week courses.

Results

An independent samples t-test determined there was no significant difference between the on-campus (M = 83.4, SD = 10.3) and off-campus (M = 86.3, SD = 10.2) classes; $t(36) = -.820$, $p = .417$. These results, Table 2 and Table 3, suggest that the delivery format of the course (traditional 16-week format or compressed six-week format) did not result in meaningful differences in the final course grades for the participating classes. Therefore, the null hypothesis was not rejected.

Null Hypothesis *(H0)* - There is no variance in overall student academic performance, as indicated by students' final course grades after two groups of undergraduate students complete the same course taught in two different modalities.

Alternative Hypothesis *(H1)* - There is a statistically significant variance in overall student academic performance, as indicated by students' final course grades after two groups of undergraduate students complete the same course taught in two different modalities.

Table 2
Group Statistics

	On/off campus	N	Mean	Std. Deviation	Std. Error Mean
Final Grade	On campus	14	83.4	10.3	2.7
	Off-campus	24	86.3	10.2	2.1

Table 3
Independent Samples Test

				Significance	95% Confidence interval	
	Critical *t*	*t*	*df*	Two-Sided *p*	Lower	Upper
Final Grade	2.028	-.820	36	.417	-9.797	4.154

The data analysis directly compared the final scores for the course between the students enrolled in the traditional on-campus 16-week course schedule and those enrolled in the off-campus compressed course schedule. There was only a small variation in the final grades for the course between the two student groups. The results indicate that there were no significant statistical differences between the two groups.

Conclusions

Conclusions Based on the Research Question

The research question stated, "Is there any variance in overall student academic performance after two groups of undergraduate students complete the same Aviation Industry Career Development (AVM 305) course taught in two different modalities?" An independent samples t-test was conducted in SPSS to determine if there was a significant difference between the on-campus and off-campus final course grades. There was no significant difference found

between the on-campus (M = 83.4, SD = 10.3) and off-campus (M = 86.3, SD = 10.2) courses; $t(36) = -.820$, $p = .417$. These results suggest that the delivery formats of the course (traditional 16-week format or compressed six-week format) did not result in meaningful differences in the final course grades for the participating students.

Concluding Remarks

Although there was not a significant statistical difference between the two groups of students, several factors required analysis as they may inform researchers of the reasons for the small variations in academic performance between the two groups. First, the compressed course schedule allowed students to concentrate on fewer courses at one time during the semester. This concentration may have allowed students to engage in a deeper learning experience during the compressed courses. The compressed format provided a more concentrated and focused learning experience. A previous research finding indicated decreased procrastination with students in compressed schedule courses, and this appears to hold true with the compressed schedule students in this research (Krug et al., 2015).

The compressed schedule sample consisted of 26 students, and throughout the six-week course, only a total of 3% of all required assignments were not submitted by the students. Conversely, the traditional 16-week courses consisted of 14 students, and a total of 6% of all required assignments were not submitted by the students. It can be concluded, based on the research findings, that the students enrolled in the 16-week course had more opportunities to procrastinate during the semester.

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Next, the same student learning outcomes (SLOs) must be provided to both groups of students. The SLOs identify observable knowledge and skills acquired after course completion, providing evidence that learning has taken place during the course. The student performance assessments allow the instructor to determine if the SLOs were achieved. In contrast, grades evaluate student performance and the quality of a student's work. Based upon the findings, the SLOs were achieved with both groups of students, although the compressed schedule students, based on their grades, exhibited a higher quality of work.

Introducing large amounts of course content to students in a short amount of time may decrease the educational value for some students. Specifically, parity of academic rigor and breadth of knowledge must be maintained for all students. Academic rigor is a standard of quality that instructors expect of their students. The standards to measure academic rigor can vary in objectivity based on performance assessments. The breadth of knowledge refers to the extent or span of knowledge that a student possesses about a subject. The research findings indicated the students from both modalities performed similarly with the same standards of academic rigor and demonstrated comparable breadth of knowledge. Although there was no significant statistical variation regarding overall performance between the two groups of students, the compressed schedule students earned a slightly higher median course grade (M = 86.3), which may indicate a greater breadth of knowledge concerning the subject matter. The findings from this research study corroborate the findings of previous research that indicated academic integrity is the same for courses taught in traditional and compressed schedule formats (Williamson, 2017).

The compressed schedule itself may promote an increased quality of learning experience for the student. The student learning experience is influenced by the characteristics of the instructor, teaching methods, classroom environment, and evaluation methods. The faculty, teaching methods, and evaluation methods were the same for both modalities; however, the classroom environment was different. Courses offered in a compressed format promote the ability of students to quickly build relationships with instructors and other students, which increases student interaction and participation in the classroom. The researcher observed in the classroom setting that the compressed schedule students, as compared with the traditional schedule students, interacted more with each other, as well as with the instructor before, during, and after class. This interaction had a positive impact on the classroom environment for the compressed schedule students.

Recommendations

Based on the findings and conclusions of this research study, the following recommendations have been formulated:

All students must receive a similar quality of instruction and educational experience regardless of modality. To maintain parity between the student groups, a similar curriculum, including course assignments and quizzes, must be used in both courses regardless of course schedules. Academic programs that provide courses using different modalities need to ensure that one master syllabus is used for both courses. The syllabus must provide an accurate and concise course description and objectives. In addition, the SLOs need to coincide with the course objectives and the academic program's SLOs. Providing consistency with these key components within the curriculum and master syllabus is key to providing the same educational learning experience for all students regardless of modality.

The ability of students to meet or exceed academic standards is influenced by the quality of the learning experience received by the student. The instructor is responsible for the overall learning experience provided to the students. The quality of the student learning experience is influenced by the characteristics of the instructor, teaching methods, classroom environment, and evaluation methods. Courses offered in a compressed format promote the ability of students to foster relationships more quickly with instructors and other students. The findings from this study showed the compressed schedule students, as compared with the traditional schedule students, interacted more with each other and the instructor before, during, and after class. This interaction positively affected the classroom environment; therefore, it is imperative that instructors teaching compressed format courses need to establish relationships with students and engage with them early in the classroom environment.

Further Research

This research study concluded that there was no significant statistical variation between the two student groups. Both groups completed the course, with the only variables being the course schedule and location. It would be beneficial to compare the performance of two student groups, with one group completing the course in a classroom environment and the other group

completing the course online. Another variable for analysis would be the delivery of the course using the synchronous or asynchronous online course models.

Next, further research with a more diverse student sample may yield varying results. This research study used a homogenous demographic sample. The student population in higher education is becoming increasingly diverse, so a more disparate research sample could provide additional findings concerning student performance in courses based on modality. Demographic diversity could include variations in age, gender, and race.

Finally, additional research is needed using the mixed methodology approach to analyze data, with the qualitative data providing clarity to the quantitative data. An analysis of how the students performed on specific performance assessments is needed, along with the calculation of correlations between variables such as grades on specific performance assessments, demographic data, and qualitative data collected through student questionnaires. Students' level of interest in the course content and career goals are two examples of qualitative data that may provide clarity to the quantitative data. The collection of qualitative data in future research will help explain why the students performed as they did and identify patterns and opinions that could explain the quantitative data.

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