



International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

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To cite this article:

Ingalls, V. (2014). Hybrid classrooms: Switchers and stayers. *International Journal of Contemporary Educational Research*, 1(2), 76-85.

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Hybrid Classrooms: Switchers and Stayers

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Abstract

The two-fold aim of this mixed methods case study was to determine the students' perception of learning in a hybridized statistics class and to determine if allowing students to change from hybrid to traditional learning platforms after midterms significantly increased their learning. Qualitative thematic elements emerged for "stayers" and "switchers" on items such as rationale for switching classes and speed of course. Quantitatively, no differences were found in the two groups' time spent online and progress on relevant objectives. However, the groups began with statistically significant differences and medium to large effect sizes in midterm exam grades ($p < .01$, $d = 2.66$), first project grades ($p < .01$, $d = .608$), and course grades ($p < .001$, $d = 2.21$). After switching, the projects, exams, and course grades were no longer statistically different. Thus, when students were in the correct environment for their particular learning style and level of motivation, the learning was equalized. This study would need to be replicated with a larger audience before making any similar results projectable to other courses and universities.

Key words: Hybrid, Blended learning, Statistics courses

Introduction

Over the course of the last twenty five years, higher education made a paradigm shift from the traditional classroom to embracing the completely online environment. According to Simonson (2005), the majority of academic leaders believe that online learning is already superior to face to face learning. There is still debate in the quality of internet-driven education with respect to student learning and student satisfaction (Noble, 2003). For instance, Klesius, Homan, and Thompson (1997) said that student satisfaction in distance education was equal to the traditional classroom. This contrasts others who claim that distance education brings decreased student satisfaction when compares to face to face learning (Ponzurick, France, & Logar, 2000). The latter claim was best summarized by Jackson and Helms (2008) in that distance learning has received mixed reviews.

Merging the elements of a traditional course with the elements expected in an online environment (Lorenzetti, 2004; Mansour & Mupinga, 2007) has culminated into yet another modality of learning. This newest model is called hybrid learning or blended learning. Combining online components and face to face learning allows the students to first encounter new information outside of the classroom, before the class actually meets (Mansour & Mupinga, 2007). Young (2002) quoted Graham Spanier, former president of Pennsylvania State College, as stating that hybrid education was "the single greatest unrecognized trend in higher education today" (p. A33). Chris Dede of Harvard University agreed that students learn better online than in a face to face environment but to combine both is the best way (Young, 2002).

Despite these high regards of hybrid education, Jackson and Helms (2008) stated that while blended learning is expanding in the number of universities who utilize this method, hybrid courses did not minimize the weaknesses of either online or face to face learning. This may be because students and faculty cherished less time spent in the classroom (Jackson & Helms, 2008; Lorenzetti, 2004; Mansour & Mupinga, 2007), wider audiences were reached through the technology, and universities benefited from the increased cost-effectiveness (Mansour & Mupinga, 2007). Others cited the benefits as less time spent on travel, increased course availability and flexibility, and decreased student inhibitions for classroom interaction (Beard & Harper, 2002; Chamberlin, 2001; Guidera, 2004). Mansour & Mupinga (2007) emphasized that distance education ensured that students would engage in at least some of the class activities and Lorenzetti (2004) identified that hybrid learning

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encouraged more in-depth processing during in-class activities. Students claim that the greatest benefit to online education is the convenience and flexibility (Mansour & Mupinga, 2007; Ryan, 2001).

Unfortunately, the factors of convenience and flexibility are not necessarily the best measures for ensuring student success (Mansour & Mupinga, 2007). A majority of students do not consider their personal learning style in their decision to enroll in either online or hybrid formats (Mansour & Mupinga, 2007). Since not all students learn the same way, no method can claim effective results for all students in a one-size-fits-all approach. In short, neither the online nor the hybrid model is ideal for everyone (Young, 2002).

Other researchers found that the strengths and weakness of hybrid models forced tradeoffs in learning (Jackson & Helms, 2008). That is, in an asynchronous environment, the learning process is slow, and limits the type and amount of interaction between student and instructor as well as between student and student (Alger, 2002; Jackson & Helms, 2008; Mansour & Mupinga, 2007; Ortiz-Rodriguez, Telg, Irani, Roberts, & Rhoades, 2005; Jackson & Helms, 2008; Wang & Newlin, 2002). One researcher also asserted that hybrid learning environments are a stuck-in-the-middle strategy for learning. That is, hybrid models are “stuck in the middle of disparate pedagogies or extremes and appears to suffer from the strengths and weaknesses of either extreme” (Jackson & Helms, 2008, p. 11). They continue to present the same weaknesses of a totally online delivery, but the addition of the face to face component did not curtail those weaknesses (Jackson & Helms, 2008). While replete with research studies on the satisfaction of students in the various learning models, the body of literature appeared to lack direct comparative data for learning between the models.

The context of the study developed when a student named “Bob” came to my office to discuss his lack of progress after receiving his midterm exam grade. After considerable discussion, both realized that the student lacked the time management skills, internal motivation, and ability to independently synthesize the learning objectives of the course. In order for “Bob” to compensate for his personal learning deficiencies and potentially be much more successful in the course, I suggested that he switch to a traditional, seated version of the course. The same professor would adapt the grade book to avoid the formal drop and add process, which had passed the official drop date. “Bob” was to immediately begin attending the seated section of the class. With fairness in mind, the professor presented the same option to the other 17 hybrid course members, six of whom opted to make the switch to a traditional classroom. I had already developed the hypothesis that the hybrid students were not developing the same levels of understanding and synthesis that the fully-engaged, traditional seated students were developing.

The question of whether or not statistics should be offered in this format in the future and, if so, how I will change my teaching methods, directed my research. Therefore, the overarching research question was how does learning statistics in a hybrid format affect student learning? I divided this into the specific qualitative research questions of (1) Is there a central theme to the survey comments for why students were not achieving high marks and decided to switch to a traditional class? and (2) Is there a common element to students’ satisfaction comments after opting to switch to a traditional classroom? Quantitatively, the research questions continued with the following inquiries: (3) Is there a significant difference in course averages?, (4) Is there a significant difference in time spent online?, (5) Is there a significant difference in course evaluation numerical ratings?, and (6) Is there an increase in regression line slopes for those who switched modalities of learning statistics?

This study is therefore a combination of phenomenological thematic analysis and a series of independent t tests for the quantitative element comparison. The two-fold aim of this mixed methods case study was to determine the students’ perception of learning in a hybridized statistics class and if allowing students to change from hybrid to traditional learning platforms after midterms significantly increased their learning. This particular situation would provide a bridge for the gap in related literature to include research which directly compares the same group of students with the same professor, text, and assignments.

Methodology

The purpose of this study was to discover the essence of the struggling hybrid-format statistics student by exploring the experience and efficacy of learning statistics in a hybrid format as compared to the traditional format. The design of the study was mixed methods, or a combination of qualitative phenomenology and quantitative independent t testing methods. Such a dual method was employed to find the rationale for switching to a traditional class, as related in research questions 1 and 2. I also wanted to test the hypotheses stated above with quantitative research questions 3 through 6 to fully compare and expand upon both the scores indicative of learning and satisfaction. For the former, the essence of experiences about the educational experience of hybrid statistics students uncovered meanings, themes, and a general description of the experience

through a set of extensive steps (Creswell, 1998). The quantitative elements retained the observational study design through data collection through the learning management system. Such data allowed for a series of independent t tests to compare the pre-switch and post-switch scores with respect to course averages, time online, evaluation scores, and score slopes while searching for statistical significance.

Participants

During the spring semester of 2013 a convenience sample of 18 students was obtained from a small private university statistics class that was built in a hybrid model. The class consisted of eight males and ten females who were second semester freshmen or sophomore status students enrolled in an applied statistics class. After receiving the results of their midterm exams, the students were given the option to switch from the hybrid section to a traditional, face-to-face classroom model with the same book, syllabus, assignments, and instructor. All students were allowed continual access to the online learning modules. Six students opted out of the hybrid model and 12 chose to remain in the hybrid course format.

Data Collection

Qualitative

As per the initial purpose of the study, the questions were developed to answer one part of the aim: to determine the students' perception of learning in a hybridized statistics class. After obtaining Institutional Review Board approval for interviewing participants, a questionnaire was administered to all 18 students representing both "stayers" and switcher groups. The inquiry asked six open ended questions regarding rationale for switching or staying in the scheduled class, as well as their personal feelings about that choice. For the staying students, the survey questions were: (a) Why did you decide not to switch from the hybrid to the traditional class for statistics?, (b) How have you benefitted from staying?, (c) Do you regret not making the switch to a traditional class?, (d) Why do you think others did switch?, (e) Would you encourage others to take a hybrid class?, (f) Understanding that the same content had to be covered in both traditional format and hybrid format, could you recommend ideas that might have helped you to learn better while in the hybrid format?, (g) Any additional comments. Similarly, the switching students were asked: (h) Why did you decide to switch from the hybrid to the traditional class for statistics?, (i) How have you benefitted?, (j) Do you regret the switch?, (k) Why do you think others did not switch?, (l) Would you encourage others to take a hybrid class?, (m) Understanding that the same content had to be covered, could you recommend ideas that might have helped you to learn better while in the hybrid format?, and (n) Any additional comments. The questions were chosen in order to provide a more robust set of answers to be coded for thematic evidence to guide further practice for teaching hybrid statistics.

Quantitative

The learning management system utilized by the university provided records and documentation regarding all facets of the quantitative research questions. That is, the course records concerning all grades were downloaded and then separated in to pre-midterm categories and post-midterm categories. The data points provide time series data to be graphed with Microsoft EXCEL and formed into best-fit regression lines. Next, further breakdown of the pre-midterm category allowed for specific categories of midterm, written research project 1, project 2, and project 3, and the final exam scores. Further data mining in the learning management system provided data outputs for log-in time in the course home, projects, tables, and weekly lessons. Finally, original summaries for the IDEA course evaluations provided hard data with respect to course summary of excellent teacher, excellent course, and progress on relevant objectives. The IDEA also provided information on specific learning objectives that were measured as part of the course evaluation: "gaining factual knowledge (terminology, classifications, methods, trends)" (IDEA, p. 2), "learning to apply course material (to improve thinking, problem solving, and decisions)" (IDEA, p. 2), and "learning to analyze and critically evaluate ideas, arguments and points of view" (IDEA, p. 2). These pieces of documentary evidence were chosen to answer the second aim of the study: to determine if allowing students to change from hybrid to traditional learning platforms after midterms significantly increased their learning. The hybrid and the traditionally seated courses were taught by the same professor, with the same text and assignment criteria to eliminate potential lurking variables.

Data Analysis

Qualitative

The survey questions were left open ended to create a more robust thematic analysis from the phenomenological constructivist perspective. The responses to the survey questions were collected by stayer/switcher group affiliation and coded by content analysis. The pattern-matching with modified analytic induction (Bogdan & Biklen, 1992) developed the central themes, thereby validating potentially meaningful connections to the hybrid and traditional statistics classroom experiences.

Quantitative

The data gleaned from the learning management system was separated first into the categories of “switchers” and “stayers”. From there, the samples of data were further refined to pre-midterm and post-midterm categories. As the data collected was from the distinct groups of stayer and switcher students to look for statistical significance, the follow up analyses were conducted after the end of the semester used a parametrical two-tailed independent t test as the primary statistical data analysis tool. The practical significance levels followed the standards set forth by Cohen (1988) for the descriptors of small, medium, and large effect sizes. The level of statistical significance was set at $p < .05$.

Results

Research Question 1: Central theme to survey comments

Questionnaires were given to each student originally enrolled in the hybrid class. Qualitatively, the students who switched presented a theme of feeling rushed, overwhelmed, and utterly lost. Out of the nine returned surveys, there were 13 statements which used the words time and speed. Additionally, seven comments stated a lack of understanding and retention of the content, six indicated issues with lack of interaction, and five acknowledged that they did not learn as well through the videos as they did in person. Four comments identified increased scores after switching, and three described appreciation for only having to go to class once a week. Moreover, none regretted making the switch. Eight out of nine would not recommend to others to take a hybrid. The one student who stated that he would encourage others to take a hybrid added the caveat “if feel that they can handle the workload.” Four students stated that hybrid students must be able to learn by themselves.

Other pertinent comments included the following: “you do not get the same teacher student interaction that you would in a traditional class,” “the traditional classes have proved to be much better than the hybrid classes,” and “I felt that in a traditional class, I would understand everything better, because I wouldn’t feel rushed and we would have had more time to go over the material.” One student commented that “you couldn’t ask the video a question,” while others mentioned “I felt overwhelmed,” “I didn’t learn as well from the videos as I did in person,” and “I don’t regret the switch because I felt like I understood everything a lot better and I felt more confident in what we learned.” The two other thought-provoking comments included, “there are not many other options other than the videos due to the time limitations” and “not having class two times a week is a plus.”

Research Question 2: Students’ satisfaction comments

Additional commentaries from the course evaluations further defined the thoughts and opinions of those who switched from the hybrid course to the traditional seated version. For example, one comment from the results in the traditional class indicated a switcher: “I hated the hybrid class!! This was much easier.” Another from the same evaluation set stated, “I hated hybrid statistics. I had to switch because my grade was so low. I feel had I been in this class all year I might have gotten at least a C.” In contrast, an explanation from someone who could not or would not switch said that the “hybrid format was a challenge. However, the professor is one of the best professors I’ve ever had. She is a wonderful professor and definitely goes the extra mile for her students. I would happily take another class from her.” Only one student who remained in the hybrid course provided the open-ended statement of “good class; I liked the hybrid format.”

Research Question 3: Course averages

Quantitatively, the grades for the eighteen students in the hybrid course through midterms averaged to 71%, but when the course grades through the midterm exam were separated by those who stayed in the hybrid to those who switched, the numbers changed to 82% and 58%, respectively. When run as an independent t test assuming equal variances, the two-tailed test value was $t(16) = 5.29$, with $p < .001$. According to the standards set forth by Cohen (1988), these results had a large effect size with $d = 2.66$, $r = .800$. The post-midterm grades averaged to 74% and 67%, again respective to the same groupings. When run as an independent t test, the two-tailed test value changed to $t(16) = 0.96$ with $p > .05$.

When further refined to specific course objective indicators such as the midterm, final, and written research, the results were mixed. The midterm exam average of the “stayers” was 84.3 and the “switchers” were at 56.8, with a two-tailed independent $t(16) = 4.69$ ($p < .01$) and large effect size at $d = 2.21$, $r = .742$. The final exam resulted 75.3 and 75.1, respectively, with a two-tailed independent $t(16) = 0.016$ ($p > .05$). The three course projects revealed means of 86, 87.6, and 89 for the “stayers” and 63.4, 75, and 90.4 for the “switchers.” Of the three class projects, only the first project which occurred prior to the switch to a traditional class was statistically significant with $t(16) = 3.66$, $p < .01$ with a medium effect size at $d = .608$, $r = .291$.

Research Question 4: Time online

The students’ ecollege logged-in times were also analyzed, though in this instance an independent t assuming unequal variances was used due to the necessity of technology in the hybrid class and the potential lack in the traditional method “switchers.” The results did not show any statistically significant differences in the time spent by students in the course home, projects, tables, or weekly lesson time summaries. The results of the average total amount of time spent in the online class or electronic companion to the seated class were 1953 minutes for the hybrid students and 1566 for the students who switched to the traditional class, but again the one-tailed test results were not significant with $t(16) = 1.18$ ($p = 0.13$).

Research Question 5: Course evaluation ratings

Next, the course evaluations were compared statistically. Raw scores from the IDEA evaluation system as implemented by the university in 2012 were used in comparison of hybrid and traditional course models for this professor. The “switchers” were included in the traditional model as they were in the seated class during the final course evaluations. The specific measures taken from the evaluation summary included scores for the categories of excellent teacher, excellent course, and progress on relevant objectives. The raw score for excellent teacher was a perfect 5.0 for the hybrid students and 4.79 (4.74 adjusted score) for the traditional class. In the excellent course classification, the scores were 4.5 (raw and adjusted) for the hybrid students and 4.35 (raw and adjusted) for the traditional students. More importantly, for progress on relevant objectives, the twelve hybrid class students scored a 4.2 (4.0 adjusted score) on a five point Likert scale while the traditional seated classes for the same class and professor averaged 4.54 (raw and adjusted) for 49 students, including those who switched to the face-to-face only format.

The raw data for each of the individual objectives rated as essential by the instructor also allowed for statistical comparisons. One of those essential objectives stated that “gaining factual knowledge (terminology, classifications, methods, trends)” (IDEA, p. 2) found two-tailed independent t test results of $t(52) = -1.06$ ($p = 0.292$), which did not demonstrate statistically significant differences between the hybrid and the traditional seated students. The other two essential objectives of “learning to apply course material (to improve thinking, problem solving, and decisions)” (IDEA, p. 2) and “learning to analyze and critically evaluate ideas, arguments and points of view” (IDEA, p. 2) displayed similarly insignificant results with two-tailed independent t tests of $t(51) = -0.61$ ($p = 0.361$) and $t(52) = -0.92$ ($p = 0.122$), respectively.

Table 1. Results of quantitative parametric research questions

Research question	Sub-category	Independent t, p-value	Cohen's d for Practical significance
3: Course averages	Pre-midterm comparison	$t(16) = 5.29, p < .001$	$d = 2.66, r = .8$
	Post-midterm comparison	$t(16) = .96, p > .05$	
	Midterm exam	$t(16) = 4.69, p < .01$	$d = 2.21, r = .742$
	Final exam	$t(16) = .016, p > .05$	
	Project 1	$t(16) = 3.66, p < .01$	$d = .608, r = .291$
4: Time online	Time online	$t(16) = 1.18, p > .05$	
5: Course evaluation ratings	Factual knowledge	$t(51) = -1.06, p > .05$	
	Apply concepts	$t(51) = -.61, p > .05$	
	Analyze and think critically	$t(51) = -.92, p > .05$	

Research Question 6: Regression line slopes

Finally, the grades of the six students who switched course formats were plotted in a time-series graph with best-fit regression lines. The slopes of the students' progress demonstrated change over time. For the measures of student learning, the greatest amount of change improved from -3.6 to $.0131$ (student #6, in Figures 11 and 12), while the others varied considerably. Figure 1 and Figure 2 show student #1 changing from a slope of 0.0148 to -0.0023 (decrease of 0.0171) while Figures 3 and 4 demonstrated an increased slope change from 0.0224 to 0.0014 (increase of 0.021). The graphs of students #3, #4, and #5 are shown in Figures 5-10 and respectively show slopes changing from -0.0494 to 0.0085 , -0.0098 to $.0209$, and 0.0462 to -0.0051 . The results of the six students' time-series graphs are shown below.

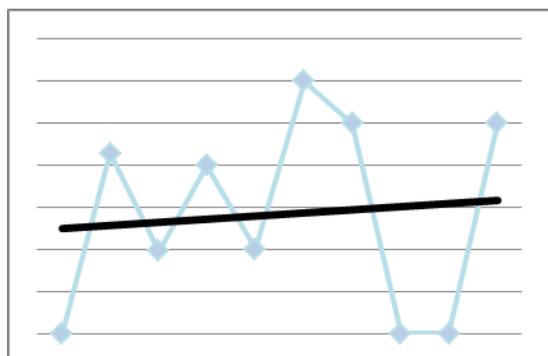


Figure 1: Student 1, pre-midterm

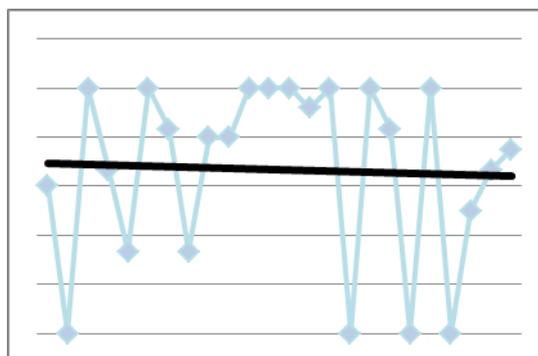


Figure 2: Student 1, post-midterm

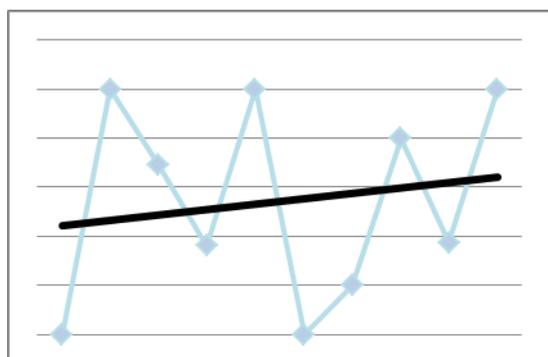


Figure 3: Student 2, pre-midterm

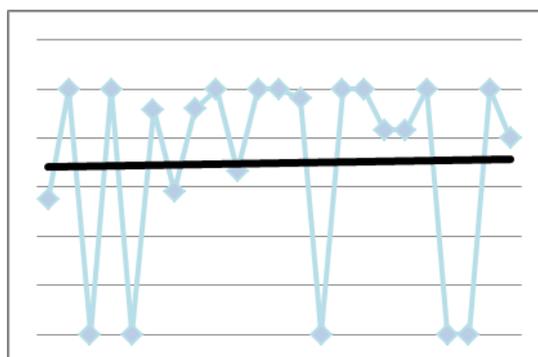


Figure 4: Student 2, post-midterm

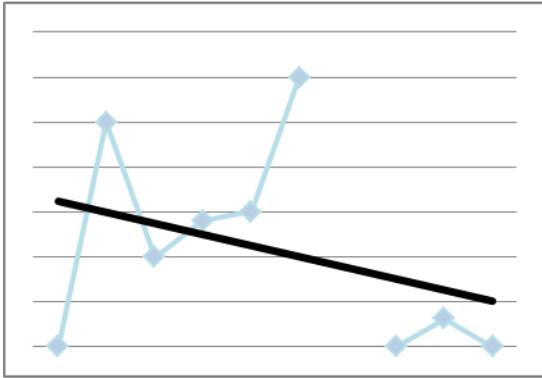


Figure 5: Student 3, pre-midterm

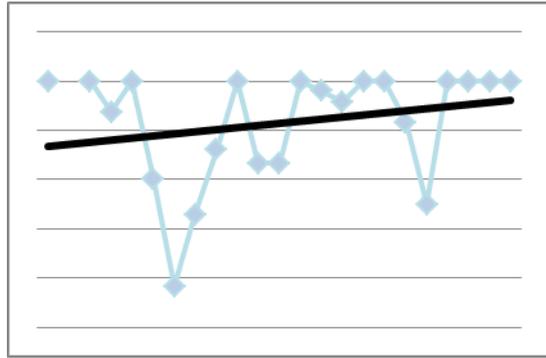


Figure 6: Student 3 post-midterm

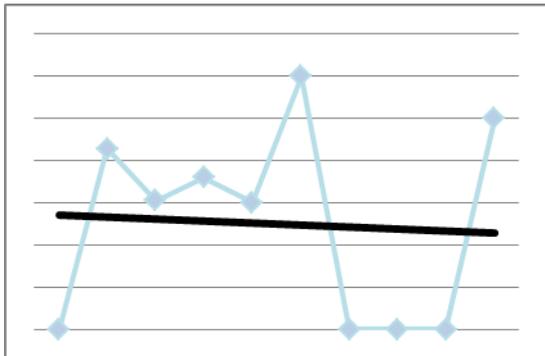


Figure 7: Student 4, pre-midterm

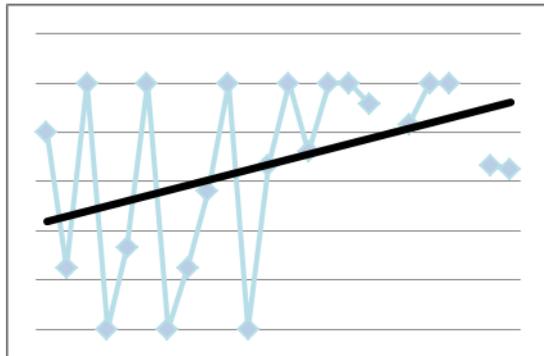


Figure 8: Student, post-midterm

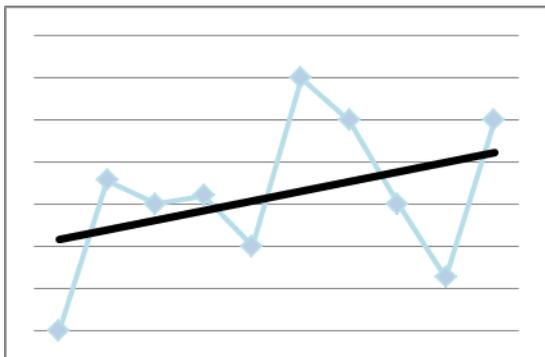


Figure 9: Student 5, pre-midterm

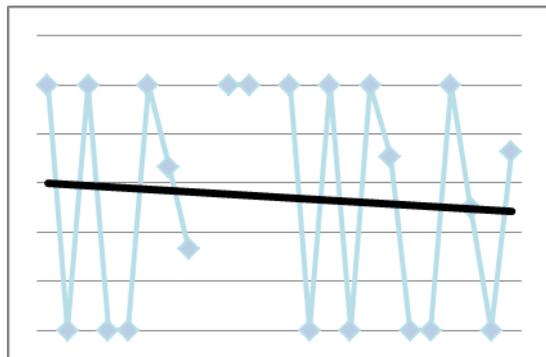


Figure 10: Student 5, post-midterm

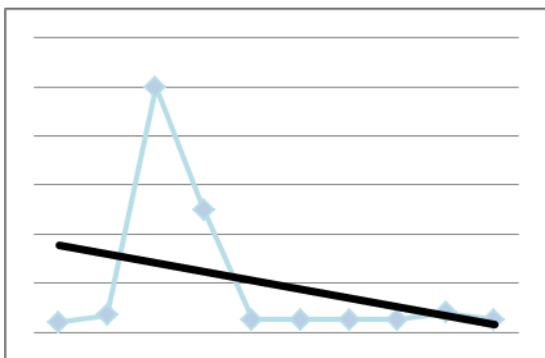


Figure 11: Student 6, pre-midterm

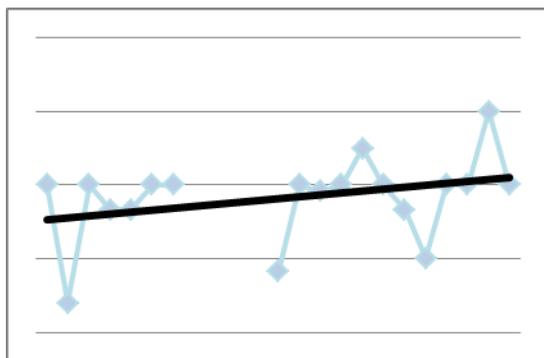


Figure 12: Student 6, post-midterm

Results and Discussion

In answer to research questions 1 and 2, when the students completed the questionnaires shortly after making the switch, a strong negative feeling toward hybrid classrooms quickly emerged. Of the students who switched, the theme of going too fast was prevalent. Multiple students commented that they needed more class time to digest the concepts. They also added the necessity for more interaction, validating the research of many prior studies (Alger, 2002; Mansour & Mupinga, 2007; Ortiz-Rodriguez, Telg, Irani, Roberts, & Rhoades, 2005; Jackson & Helms, 2008; Wang & Newlin, 2002). The comments on the final course evaluations registered similar attitudes.

The IDEA evaluation system further emphasized that learning strategies and time management skills might be the rationale for a student to take a certain course, rather than its modality. With respect to the quantitative research question 3, the fact that the students were statistically significant in their grades up to midterms demonstrated an initial discrepancy in either achievement or motivation. The effect size was quite large according to Cohen (1988), which means that the magnitude of difference in the treatment is large. The statistically significant differences in the first course project potentially indicated the same issue. As initially hypothesized, switching the students changed the behavior. That is, after the “switcher” students were placed into the traditional seated course and met twice a week, the grade differentials were no longer statistically significant. The effect size for the project one statistical test showed a medium effect of treatment, thereby considered practical and applicable to the general population. (It may be noted that attendance was not an issue for any of the students in the study as any students with attendance issues dropped the course immediately after the midterm exam and were thus excluded from any analysis.)

With respect to the time spent in the online components of the course for research question 4, the lack of significance was surprising. The hypotheses were one-tailed as the hybrid students, by nature of their coursework, should ideally spend more time in the online environment. The averages were certainly different for those who remained in the hybrid and were forced to interact with the content online to those who switched and were not obligated to immerse themselves in the content, but those large differences are not large enough to state that the means would be different in the population. What happened with respect to time was simply chance, or sampling error. The results also indicated that once the student switched to the traditional format, the students may have developed a certain level of comfort with in-class discussions, no longer felt the need to self-teach, and were potentially more able to disengage from learning activities. The switching students may also have become much more apathetic to learning outside of class, since the content would be taught by lecture, activity, and discussion in the classroom. Such a concept supports the work of Lorenzetti (2004) with respect to hybrid learning forcing student interactions and deeper processing. The results showed that post-switch, only 739 minutes were logged between the six switch students, averaging to about 15 minutes per week per student. The reality was that after week nine of the semester, only two students logged in any week. This number narrowed to only one student logging into the online class components after week 11. In fact, one of the switching students only logged into the course once in the entire 14 weeks for a total of 56 minutes.

As background knowledge to research question 5, the IDEA system rating page explained that “adjusted scores make classes more comparable by considering factors that influence student ratings, yet are beyond the instructor’s control. Scores are adjusted to take into account student desire to take the course regardless of who taught it, student work habits, instructor reported class size, student effort not attributable to the instructor, and course difficulty not attributable to the instructor” (IDEA, p. 1). Thus, both scores were reported in the results section. The re-creation of the raw data set (from the back side of the IDEA evaluation page) found that the raw scores of the groups failed to demonstrate any statistically significant differences, contrasting other prior research (Ponzurick, France, & Logar, 2000). The results of the student evaluation system showed that both groups of students viewed the professor and the course in a favorable light. The similar numbers for teacher and course indicated similar positive experiences with the text, coursework, and teacher rapport, thereby isolating the course modality as the treatment variable. The interaction with the content, fellow students, and teaching style were the parts that were different.

The results of the progress on relevant objectives (research question 5), when coupled with the statistically significant differences in the beginning of the semester (research question 3) demonstrated that the grades for the students who switched were substantial. The IDEA evaluation system showed that there was no statistically significant difference in any of the three essential objectives between the two groups. More specifically, in post hoc analysis, the grades of the “stayers” were significantly greater than the “switchers” before the midterm exam. After placing students in what might be considered a more suitable learning format, the grades post-midterm were no longer statistically significant between the two groups. One interpretation is that of a

significant gain for the students who switched formats to better accommodate their learning needs. This says that if the results were to be inferred upon the population, when students are in the correct learning environment for their particular learning style and level of motivation, all can succeed equally. Nonetheless, it should be recognized that the sample size and scope of this study are quite limited; this study would need to be replicated with a larger audience before making any similar results projectable to other courses and universities. In light of that, more research needs to be done in the area of measurement of student learning (Noble, 2003).

When the switching students' grades were plotted in a time series graph with a best fit regression line applied, the results were an inconsistent answer to research question 6. Three of the students' grades completely changed direction. They went from negative slopes indicative of rapidly decreasing grades to a positive slope showing academic progress. While those three students gave credence to the hypothesis that switching would be good for students who identified themselves as not being successful, the other three did not produce similar results. That is, the slopes of two of the six students changed from increasing to decreasing, and one went from rapidly increasing before midterms to flat-lining, albeit at a higher mean than before the increase. The slopes of the curves demonstrate that two-thirds of the switching students were able to improve their grades. Though not necessarily statistically significant, the best fit-lines are indicative of an increase in numerical assessment percentages for the majority. The time-series analysis of the grades does not fully support the original hypothesis for allowing the students to switch to a traditional format. This particular result exemplifies the debate of student learning put forth by previous studies (Noble, 2003; Ponzurick, France, & Logar, 2000). Moreover, the sample size was very small and precluded the results of this study to be generalized to others. Expansion of the sample size in replication studies would be imperative.

Conclusion

While I would volunteer to teach the hybrid course again, I would not expect for the results to be any different. According to Mansour & Mupinga (2007), students choose to take a hybrid course for its convenience, without thought to their learning needs. Unless this underlying cause is fixed, the problem of both the student and the professor feeling rushed to get through the mandatory content will remain, potentially revealing the depth of the weaknesses reported by Jackson and Helms (2008). In order for a hybrid course to be successful, the students must possess the requisite motivation and learning styles to accommodate independent learning: they must be able to learn both the "hows" and the "whys" on their own, thereby allowing more seated class time for synthesizing course concepts in large group activities. This idea negates Lorenzetti (2004), but corroborates the debatable benefits given by other researchers (Noble, 2003). Some potential effects would be deeper learning, better classroom discussions, and ensuing higher levels of analysis on course projects and papers. Another anticipated result would be greater levels of satisfaction with the course format.

For those who realize their limitations and stay within the realm of traditional seated courses, a hybrid of hybrids may serve them best. That is, if such students were to take a seated class using a "flipped" instructional model heavily embedded in technology, they may enjoy the learning process and receive the positive benefit to their learning. Inverted classroom theories employ the best of both worlds (Arnaud, 2013; Berrett, 2012; Davies, Dean, & Ball, 2013; Fickes, 2013) in that they utilize the hybrid idea of granting students electronic access to course concepts prior to class sessions and deeper learning pedagogies within the seated classes, but are taken at a slower pace by comparison. The inverted instructional model applied to a traditional class would only cover one concept a day, with time to digest and synthesize major concepts in between class sessions. This would allow for greater degrees of student engagement and less of a lecture format, more of what many envision a hybrid course to be.

In summary, the initial problem was that the hybrid students were not progressing on common learning objectives as the same rate as the seated students. In an attempt to fix the issue, the students were allowed to switch learning modalities. The research grew from *ex post facto* analyses to see if the switching students reaped the learning benefits as measured by evaluative comments at the end of the semester and grades. The quantity of the qualitative statements complimenting the course and professor were similar and many of the quantitative comparative tests lacked statistical significance. In the nature of this study it was a good thing. It meant that the original discrepancy between hybrid and traditional was eliminated.

Recommendations

Despite all of those thought-provoking and potentially applicable results, the overall effects of the study are inconclusive for the population as it is recognized that the sample size for this study was extremely small and generalizability is limited. Future studies might expand upon this course format research through an entire semester with much larger groups of students. Another area of prospective research would be to compile an interdisciplinary sample of data that focuses on students' level of analysis and synthesis of course concepts and again compare by course format.

Though the results may not be inferred to other populations as yet, there are lessons from this research that may still be applied to higher education. For instance, a suggestion for upcoming hybrid course sections would be to assess student learning styles on the first day of class and offer them to switch to a traditional class much sooner. Passing a copy of this article might also be beneficial, especially the qualitative sections concerning comments on why students made the switch and their success after the fact. Whether the students switch or not, recognition of the potential problems may substantially improve the experience for all.

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