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Behind the Final Grade in Hybrid v. Traditional Courses: Comparing Student Performance by Assessment Type, Core Competency, and Course Objective

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Abstract

There are many different delivery methods used by institutions of higher education. These include traditional, hybrid, and online course offerings. The comparisons of these typically use final grade as the measure of student performance. This research study looks behind the final grade and compares student performance by assessment type, core competency, and course objective. The statistical conclusions showed that hybrid course delivery could produce similar if not better results than traditional delivery. In addition, students performed significantly higher in assignments, critical thinking, written communications, and the advanced course objectives. Surprisingly, there appeared to be little if any impact on group projects and teamwork skills in the hybrid sections. Therefore, this study supports the hybrid delivery method for courses with similar course components.

Keywords: assessment, core competency, course objectives, delivery method, hybrid, traditional

1. INTRODUCTION

Institutions of higher education are in the business of educating students, offering a variety of degree programs and providing it through many different delivery methods. These delivery methods primarily include the traditional face-to-face course conducted in a classroom, online courses using some type of web-based technology, and the more contemporary hybrid courses that employ a combination of the previous two. Traditional, or face-to-face, instruction brings the instructor and the students together in the same location at the same time each week for class meetings. The content and structure of the class vary, but at a minimum include some type of lecture and

class discussions. Whereas online course delivery uses technology to deliver the course content and assess the students without the need of a physical classroom or any face-to-face time. Hybrid courses consist of both the traditional class meetings, although typically less sessions, and an online component. This type of delivery method is also referred to as blended and started more recently around 2001 (Martin, 2003). With the exception of fully online universities, the traditional delivery method is still the most widely used method among instructors. However, online course and hybrid course offerings are increasing (Allen, Seaman, & Garrett, 2007; NCES, 2008; NEA, 2000). Many attribute this growth to the changing needs of the new generation of students (Kraft &

Kakish, 2009). Others suggest technology allows hard-to-reach students to attend courses that otherwise could not because of geography, time restraints, or disabilities (USDLA, 2001). Some instructors point out the ability to improve their teaching with new tools and techniques (Toth, Amrein-Beardsley & Foulger, 2010). Regardless of the reasons, the important questions are whether these new delivery methods work at least as well as traditional methods and are they the right fit for all courses.

There are many research studies comparing course delivery methods using final grades as the measure of student performance, but few studies that focus specifically on comparing student performance by course components. These components being the different types of assessments, core competencies or skills, and course objectives. Individual assignments, group projects, and exams are a few examples of the more common assessment types. Students may perform well on one of these but not well on others for a variety of reasons. For example, students may find group projects more challenging in a hybrid course since there is less face-to-face interaction among the group members. The skills required to complete each of the assessments are also different. Some assessments require critical thinking skills while others require teamwork skills. For the course objectives, again these vary as well in content and difficulty. The beginning of the course may focus on basic theory and concepts while the latter part of the course delves into more advanced topics. The more advanced objectives may require more classroom discussion based on student feedback. The grade for each of these assessments has a direct impact the final grade. Therefore, it is important to compare student performance at a more detailed level to identify whether the course delivery method has an impact on specific course components that result in the final grade of the student in the course. This may also impact which courses are well suited or not to particular delivery methods.

The purpose of this study was to compare student performance between the hybrid and traditional course delivery methods by looking behind the final grade at specific course components. The study compared student performance by assessment type, core competency (skill), and course objective. This was done in a junior-level information systems course over two semesters where each semester

one section was taught using traditional course delivery and one section was taught using hybrid course delivery. This would hopefully provide valuable information as to the effectiveness of the hybrid model for this particular set of students and this type of institution, where the majority of students have not been exposed to hybrid or online delivery methods. Instructors have the option as to whether they offer their courses in the hybrid format but must first obtained approval. Only a few sections of a few courses (less than 1% or about 3/120 sections) were offered in the hybrid format during the Spring 2011 semester. Fully online courses are not being offered at this time in the business school. A very small number of fully online courses are being offered at the college in other areas. The results may also be useful to other institutions with similar students and institutions exploring the benefits of distance education, particularly the hybrid model.

2. LITERATURE REVIEW

Research studies comparing course delivery methods commonly use final or exam grades as the measurement of student performance. This includes a meta-analysis conducted by the Department of Education of over a thousand empirical studies of online learning from 1996 through July 2008 (USDOE, 2010). Final grades, along with a few other learning outcomes, show evidence that students performed better in courses using both online and blended delivery than courses using traditional delivery methods. However, this analysis also showed that the difference between online and traditional course delivery was larger than between blended and traditional course delivery (USDOE, 2010). Regardless of the results of this study, the important item to note is the use of overall grades in a course as a measurement of student performance.

Other research studies that were not part of the Department of Education study also used final grades for measuring student outcomes and performance. One study, based on final course grades, showed a significant difference between traditional, internet-based, and hybrid delivery methods with the internet-based method outperforming the other two (Reasons, Valadares, & Slavkin, 2005). The results of this study differ from the Department of Education study, but the authors did note that they expected the differences to be stronger than they were. They predicted that the students in

the hybrid sections would outperform the students in the traditional and internet-based sections. Their study also showed no difference between the hybrid and traditional courses. In complete contrast, another study comparing online versus traditional courses showed the traditional courses producing higher final course grades (Ury, 2005). This study did show the online delivery method as effective but the mean score for the online sections was significantly lower than the mean scores of the traditional sections. Two other studies also used final grades as their comparison measure but showed the percentage or number of letter grades (As, Bs, Cs,) achieved in a hybrid versus a traditional course (Scida & Saury, 2006; Hensley, 2005). Interestingly, the first study showed students performing significantly higher in the hybrid course and the second study showing the opposite.

Other research studies comparing course delivery methods tend to focus on exams (pre, post, midterm, final) instead of final course grade. One such study used the combined score of two midterms and one final exam to compare the blended versus the traditional approach and showed no significant difference between the two (Xu, Meyer, & Morgan, 2008). Similarly, another study examined three different exams and the overall exam average between students in traditional, hybrid, and web-based classes. This study also showed no significant difference among either the exam or the overall exam average (Rivera & Rice, 2002). Utts, Sommer, Acredolo, Maher, & Matthews (2003) used pre- and post-tests and also showed no difference between student performance in classes using traditional and hybrid instruction. As a side note, this study did show a difference in the evaluation of the two delivery methods. Students reported a slightly more positive view of tradition delivery. In complete contrast, another study showed online course delivery producing lower scores on final exams then both the traditional or hybrid delivery methods with hybrid outperforming traditional (Abdullat & Terry, 2005).

These previous studies comparing student performance by course delivery method vary in the results, with some showing each type of delivery method producing significantly higher results. The main type of measurement used for this comparison is final course grades or various exams grades. Some of the studies reviewed by the Department of Education did use other learning outcomes besides grades and exams but none are specifically discussed in the meta-analysis. This research study breaks down the final grade into different course components in order to identify any possible underlying issues with hybrid courses.

3. METHODOLOGY

The methodology used for this study consisted of combining the grades for two hybrid and two traditional courses and calculating an average score for each type of delivery method, one for the hybrid model and one for the traditional model. The grades were broken down into the three different course components of assessments types, core competencies, and course objective.

Information Systems Course Description
The particular course used for this study was a junior-level information systems course in the School of Management at a medium-sized, four-year, public college in southern New England. The goal of this course is to present a core of information systems principles with which every business student should be familiar and to offer a survey of the information systems discipline that will enable all business students to understand the relationship of advanced courses to the curriculum as a whole. The main course objectives include Information Systems Concepts, Management, and Security, Information Technology Fundamentals, and Business Structure and Processes. This course is required for Accounting, CIS, Management, and Marketing majors. The college offers at least three sections of the course each semester with a maximum class size of 32 students. A typical section consists of about 30% Accounting majors, 10% CIS majors, 30% Management majors, 10% Marketing majors, and 10% other majors. The other majors can include Finance, Economics, Computer Science and Communications majors. The sample for this study was 125 students, 62 in the two hybrid sections and 63 in the two traditional sections. The same instructor taught all four sections.

Traditional Sections
The traditional courses met twice per week for lecture, discussion, and group projects. The lectures used slides provided, but modified, by the textbook and posted on Blackboard. The course work for the traditional sections consisted of individual assignments, group projects, and exams. The individual assignments were

discussed in class but the students completed on their own outside of class. The group projects were also discussed in class and the last 15-20 minutes of each class session was set aside for group meetings. The exams were conducted in class and consisted of multiple choice and short essay questions.

Hybrid Sections

The hybrid courses met once per week for lecture, discussion, and group projects. Again, the lectures consisted of the same set of slides as the traditional course but with less discussion time available during the class sessions. The course work for the hybrid sections consisted of the same individual assignments, group projects, and exams. The only difference was that the group project meetings were once a week versus twice a week in the traditional course. The hybrid course also required the students to read a case study from the textbook and post a comment to an online discussion board created in Blackboard. This was part of the participation grade for the course and not one of the assignments.

Assessment Types

The course consisted of three types of assessments. These included individual assignments, group projects, and exams. Since the course was divided into three modules, there was one of each type of assessment for each module. Therefore, there were three individual assignments, three group projects, and three exams throughout the course. The individual assignments consisted of various discussion and comprehension questions based on each chapter of the textbook covered in class. The group projects required the groups to create a written report for module 1, a diagram for module 2, and a presentation for module 3. Again, the exams consisted of multiple choice and short essay questions.

Core Competencies

In order to compare student performance by core competency, the core competencies needed to be associated with each assessment type. Each assessment type was examined for the required core competency as defined by the School of Management. For the purposes of this study, the core competencies were organized for simplicity and applicability to the course. Each core competency was renamed using a single word or phase. For example, *Prepare written communications such as proposals that are correct, clear, concise, and appropriate* was

simplified to *Written Communication*. Three separate core competencies related to Teamwork and four related to Critical Thinking were combined into one each, respectively. Two of the thirteen core competencies were not applicable to the course and therefore were not used. This process created the five core competencies of Ethics, Critical Thinking, Oral Communications, Teamwork, and Written Communications (Appendix: Table 1).

Course Objectives

The course consists of ten course objectives that were combined into three major objectives for simplicity, allowing for the three modules of the course. The three major course objectives were Concepts, Information Technology, and Information Systems. Finally, the assessment types, core competencies, and course objectives were combined into a table for readability and organization (Appendix: Table 2).

Research Questions

The research questions for this study are based on the assessments types, core competencies, and course objectives. Although the previous research studies show mixed results on the performance of different delivery methods, this study based its hypotheses on the results of the Department of Education (DOE) meta-analysis. Again, the DOE study showed hybrid courses outperformed traditional courses. Each hypothesis in this study will predict that the hybrid sections will outperform the traditional sections on each of the three assessments.

The research questions for the assessment types include the three types of assessments (assignments, group projects, and exams). This created three hypotheses (H_1, H_2, and H_3).

H_1: Students in the hybrid sections will have significantly higher <u>Assignment Grades</u> than students in the traditional sections.
H_2: Students in the hybrid sections will have significantly higher <u>Group Project Grades</u> than students in the traditional sections.
H_3: Students in the hybrid sections will have significantly higher <u>Exam Grades</u> than students in the traditional sections.

The research questions based on the core competency include the five core competencies of Ethics, Critical Thinking, Oral Communications, Teamwork, and Written

Communications. Therefore, there are the five hypotheses (H_4, H_5, H_6, H_7, and H_8).

H_4: Students in the hybrid sections will have significantly higher <u>Ethics Grades</u> than the students in the traditional sections.

H_5: Students in the hybrid sections will have significantly higher <u>Critical Thinking Grades</u> than students in the traditional sections.

H_6: Students in the hybrid sections will have significantly higher <u>Oral Communications Grades</u> than students in the traditional sections.

H_7: Students in the hybrid sections will have significantly higher <u>Teamwork Grades</u> than students in the traditional sections.

H_8: Students in the hybrid sections will have significantly higher <u>Written Communications Grades</u> than students in the traditional sections.

The research questions based on course objective include the three major objectives of the course (Concepts, Information Technology and Information Systems). This created three hypotheses (H_9, H_{10}, H_{11}).

H_9: Students in the hybrid sections will have significantly higher <u>Concept Grades</u> than students in the traditional sections.

H_{10}: Students in the hybrid sections will have significantly higher <u>Information Technology Grades</u> than students in the traditional sections.

H_{11}: Students in the hybrid sections will have significantly higher <u>Information Systems Grades</u> than students in the traditional sections.

A final hypothesis was added to compare the final grades of both delivery methods.

H_{12}: Students in the hybrid sections will have significantly higher <u>Final Grades</u> than students in the traditional sections.

4. RESULTS

The results for each course component are discussed below and summarized for all areas in Table 8 (see Appendix). Each of the eleven hypotheses is a directional hypothesis. The t-test was used to compare the grades because there is one independent variable, two factors in the independent variable, one dependent variable, and quantitative data. The independent variable has two levels, one for the

average grade in the hybrid sections and one for the average grade in the traditional sections. The dependent variable is performance measured by grades. The quantitative data consisted of numerical scores to two decimal places. The independent t-test was used because the grades for the students were not related. There was no connection between the students in the hybrid and traditional sections. The sample size included 62 students in the hybrid sections and 63 students in the traditional sections with a total of 558 and 567 individual grades respectively. This sample is representative of the population of the School of Management at this institution.

Assessment Types
The assessment types included assignments, group projects and exams. There were three assignments, three group projects, and three exams required for each section of the course. An assignment average, group project average, and exam average was calculated for each type of course, one for the two hybrid sections and one for the two traditional sections. A total of 186 and 189 individual grades, respectively, were used in the calculations. The hypotheses were that the students in the hybrid sections will have significantly higher grades than the students in the traditional sections. The results supported this only for the assignments (Appendix: Table 5). The group projects and the exams did not show a statistically significant difference.

H_1 was supported.
The students in the hybrid sections did have significantly higher <u>Assignment</u> grades that the students in the traditional sections.

H_2 was rejected.
The students in the hybrid sections did not have significantly higher <u>Group Project</u> grades that the students in the traditional sections.

H_3 was rejected.
The students in the hybrid sections did not have significantly higher <u>Exam</u> grades that the students in the traditional sections.

Core Competencies
The core competencies included Critical Thinking, Ethics, Oral Communications, Teamwork, and Written Communications. Again, an average grade was calculated for each type of course, one for the two hybrid sections and

one for the two traditional sections for each core competency. Unlike the assessment types, each core competency included one or a combination of assessment types used for the average grade (Appendix: Table 3). Critical Thinking used the three assignment grades, the three group project grades, and the three exam grades. This included 558 individual grades for the hybrid sections and 567 individual grades for the traditional sections. Ethics only used Assignment 1 and Exam 1. This included 124 individual grades for the hybrid sections and 126 individual grades for the traditional sections. Oral Communications used only Group Project 3. This included 62 individual grades for the hybrid sections and 63 individual grades for the traditional sections. Teamwork used all three of the group projects. This included 186 individual grades for the hybrid sections and 189 individual grades for the traditional sections. Written Communications used all three assignments and the first two group projects. This included 310 individual grades for the hybrid sections and 315 individual grades for the traditional sections. The hypotheses were that the students in the hybrid sections would have significantly higher grades than the students in the traditional sections. The results supported this only for two (Critical Thinking and Written Communications) of the five core competencies (Appendix: Table 6). Again, the average scores for all five competencies

H_4 was supported.
The students in the hybrid sections did have significantly higher <u>Critical Thinking</u> grades that the students in the traditional sections.

H_5 was rejected.
The students in the hybrid sections did not have significantly higher <u>Ethic</u> grades that the students in the traditional sections.

H_6 was rejected.
The students in the hybrid sections did not have significantly higher <u>Oral Communications</u> grades that the students in the traditional sections.

H_7 was rejected.
The students in the hybrid sections did not have significantly higher <u>Teamwork</u> grades that the students in the traditional sections.

H_8 was supported.
The students in the hybrid sections did have significantly higher <u>Written Communication</u>

grades that the students in the traditional sections.

Course Objectives
The course objectives included the three major items of Concepts, Information Technology, and Information Systems. Again, the course was organized into three modules corresponding to the course objectives (Appendix: Table 4). The Concepts included Assignment 1, Group Project 1, and Exam 1. Information Technology included Assignment 2, Group Project 2, and Exam 2. Information Systems included Assignment 3, Group Project 3, and Exam 3. Just like the assessment types and the core competencies, an average grade was calculated for each type of course, one for the two hybrid sections and one for the two traditional sections. All three of the course objective items included 186 individual grades for the hybrid sections and 189 grades for the traditional sections. The hypotheses were that the students in the hybrid sections would have significantly higher grades than the students in the traditional sections. The results supported this both Information Technology and Information Systems but not for Concepts (Appendix: Table 7).

H_9 was rejected.
The students in the hybrid sections did not have significantly higher <u>Concept</u> grades that the students in the traditional sections.

H_{10} was supported.
The students in the hybrid sections did have significantly higher <u>Information Technology</u> grades that the students in the traditional sections.

H_{11} was supported.
The students in the hybrid sections did have significantly higher <u>Information Systems</u> grades that the students in the traditional sections.

5. CONCLUSIONS

This research study looked behind the final grade in hybrid and traditional courses by comparing student grades in assignments, core competencies, and course content. Although the results were not consistent between these items, they did provide some evidence that hybrid course delivery can produce similar if not better results than traditional delivery. In addition, there were several surprises in the areas related to group projects, teamwork, and the advanced course objectives.

Assessments

For the three assessment types, assignments grades were significantly higher in the hybrid courses. The assignments were exactly the same for the both types of courses. The thinking would be that the traditional grades would be higher because the additional class time allowed for longer class discussions and clarification of course content. Therefore, there is some unknown agent impacting the grades in the hybrid sections allowing for the higher grades. As for the group projects, common sense would say that group projects grades would be higher since the traditional sections had two class meetings per week for group meetings, where the hybrid sections only had one class meeting per week. Again, the same thinking would be that that the extra time meeting as a group would help the group members complete the group projects. Although the statistics did not show a significant difference, students in the hybrid courses (90.65) did complete the group projects just as well as the students in the traditional course (89.01). They have obviously figured out methods for working together with less face time and were able to collaborate virtually. There is also the possibility that students divided the work more efficiently, knowing that they have less time to work together in class. Another possibility could be that students work better with less group meetings due to the fact that not all students like group projects or working with other students. Less group meeting time reduces the chances for issues, conflicts or free loading. Further study would be needed in this area. However, the good news for hybrid delivery methods is that this study showed that hybrid courses could produce as good, if not better grades, than traditional courses in various types of assessments. In addition, the hybrid delivery method did not have a negative impact on group projects.

Core Competencies

Of the five core competencies of the course, students had significantly higher grades in Critical Thinking and Written Communication. For Critical Thinking, there is support that the self-paced learning in a hybrid course increases content retention (Rainer & Cegielski, 2011). This could attribute to the higher grades in this area. There may be some students that assume the extra lecture time in traditional courses will in and of itself help them learn and retain this information, where students in hybrid courses know they must read and learn the material on their own. For Written Communication, the requirement of posting to an online discussion in the hybrid sections may have contributed to the higher grades. In addition, students interact with other students and the instructor more by Written than Oral Communications in a hybrid course. This also could improve this skill area. For Ethics and Oral Communications, the course material was covered the same way in both delivery methods and both types of courses required one oral presentation. In both skill areas, the average student grade was higher in the hybrid sections just not at a significant level. So again, the hybrid sections had a positive impact. Lastly, the Teamwork skills did not show a significant difference in student grades but again, the average grade in the hybrid sections (90.65) was higher than the higher grade in the traditional sections (89.01). Thus showing no major impact on this skill set for hybrid courses.

Course Objectives

The results of student grades by course objective showed significant differences in two of the three modules. The Concepts module did not show a significant difference and was the only area out of the Assessments, Core Competencies, and Course Objectives that produced a higher average for the traditional sections (86.71) than the hybrid sections (86.21). Both the Information Technology and Information Systems modules did produce significantly higher results in the hybrid sections. These modules contain more difficult material than the Concepts module. Again, this supports the research that hybrid delivery methods can produce higher grades.

For the last part, it was important to look at and compare Final Grades between the two delivery methods as was done in other research studies. In this case, Final Grades were not significantly higher in the hybrid sections but the average grade (84.86) was very similar to the average grade of the traditional sections (84.49). And although the Critical Thinking skill in the Core Competencies included all the grades for the course, it was not the weighted average used to calculate the Final Grade.

6. IMPLICATIONS

Overall, the results of this research study showed that student performance in hybrid courses does vary by course component. More

importantly, it also showed that students in hybrid course could perform as well as students in traditional courses and in some cases better. This includes students that have not been exposed to hybrid delivery methods. As for the course components, group projects may be used in hybrid courses without having a negative impact on grades. This study also showed that in the area of core competencies (skills), hybrid courses could produce similar student performance, and they may even improve performance in critical thinking and written communications. Lastly, the results showed significant differences in the more advanced course objectives. This again is a positive indication that courses with advanced topics may be suitable to the hybrid delivery method. Of course, more research is needed to examine other types of course components than the assessment types, core competencies, and course objectives of this study. However, this provides some insight behind the final grades in hybrid versus traditional courses.

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Appendix

Table 1

Core Competency	Core Competencies of the School of Management
Written Communications	1. Prepare written communications such as reports and proposals that are correct, clear, concise, and appropriate.
Oral Communications	2. Present oral communications that are correct, clear, concise, and appropriate to small or large groups, in planned or extemporaneous formats, and in response to formal or informal requests.
Teamwork	3. Work effectively with individuals, and in groups with diverse members.
	4. Influence others.
	5. Manage and resolve conflicts.
Critical Thinking	6. Identify, analyze, and solve both structured and unstructured problems in a logical and/or creative manner.
	8. Manage restricted resources such as time, capital, human resources, and materials.
	10. Draw inferences, reach conclusions, and apply knowledge to new situations.
	11. Use efficient learning techniques to acquire and apply new knowledge and skills.
Ethics	7. Use value-based reasoning to develop appropriate responses to ethical situations.
Not applicable to course	12. Reason mathematically and apply quantitative analysis methods; including interpreting charts, tables, and graphs; and applying concepts to word situations.
	13. Use computers to process information for communications, mathematical applications, problem solving, and decision-making.

Table 2

Assessment Type	Core Competency	Course Objective
Assignments		
Module 1	Written Communication, Critical Thinking, Ethics	Concepts
Module 2	Written Communication, Critical Thinking	Information Technology
Module 3	Written Communication, Critical Thinking	Information Systems
Group Projects		
Module 1	Written Communication, Critical Thinking, Teamwork	Concepts
Module 2	Critical Thinking, Teamwork	Information Technology
Module 3	Oral Communication, Critical Thinking, Teamwork	Information Systems
Exams		
Module 1	Critical Thinking, Ethics	Concepts
Module 2	Critical Thinking	Information Technology
Module 3	Critical Thinking	Information Systems

Table 3

Core Competency	Assessment Type
Critical Thinking	Assignments 1-3, Group Projects 1-3, Exams 1-3
Ethics	Assignment 1, Exam 1
Oral Communications	Group Project 3
Teamwork	Group Projects 1-3
Written Communications	Assignments 1-3, Group Project 1-2

Table 4

Course Objective	Assessment Type
Concepts	Assignment 1, Group Project 1, Exam 1
Information Technology	Assignment 2, Group Project 2, Exam 2
Information Systems	Assignment 3, Group Project 3, Exam 3

Table 5

Assessments	Count	Mean	Std Dev	ANOVA p-value	t test p-value
Assignments (H$_1$)					
Grades - Hybrid Sections	186	88.31	12.16		
Grades - Traditional Sections	189	85.48	17.28		
Reject Null - 0.03 < alpha (0.05) ***Hybrid grades significantly higher***				0.06785**	0.03392
Group Projects (H$_2$)					
Grades - Hybrid Sections	186	90.65	9.17		
Grades - Traditional Sections	189	89.01	14.33		
Fail to Reject Null - 0.19 > alpha (0.05) *Hybrid grades not significantly higher*				0.18995**	0.1886
Exams (H$_3$)					
Grades - Hybrid Sections	186	79.21	10.56		
Grades - Traditional Sections	189	77.90	13.18		
Reject Null - 0.14 > alpha (0.05) *Hybrid grades not significantly higher*				0.28915**	0.14417
* ANOVA *p-value* < 0.05 Equal Variance Not Assumed ** ANOVA *p-value* >= 0.05 Equal Variance Assumed					

Table 6

Core Competency	Count	Mean	Std Dev	ANOVA p-value	t test p-value
Critical Thinking (H$_4$)					
Grades - Hybrid Sections	558	86.06	11.77		
Grades - Traditional Sections	567	84.13	15.70		
Reject Null - 0.01 < alpha (0.05) *Hybrid grades significantly higher*				0.02031*	0.01002
Ethics (H$_5$)					
Grades - Hybrid Sections	124	85.55	11.81		
Grades - Traditional Sections	126	85.21	12.46		
Fail to Reject Null - 0.054 > alpha (0.05) *Hybrid grades not significantly higher*				0.10853**	0.05427
Oral Communications (H$_6$)					
Grades - Hybrid Sections	62	91.81	13.05		
Grades - Traditional Sections	63	88.00	20.62		
Fail to Reject Null - 0.11 > alpha (0.05) *Hybrid grades not significantly higher*				0.22070**	0.11035
Teamwork (H$_7$)					
Grades - Hybrid Sections	186	90.65	9.17		
Grades - Traditional Sections	189	89.01	14.33		
Fail to Reject Null - 0.09 > alpha (0.05) *Hybrid grades not significantly higher*				0.18995**	0.09498
Written Communications (H$_8$)					
Grades - Hybrid Sections	310	89.00	10.28		
Grades - Traditional Sections	315	87.09	14.88		
Fail to Reject Null - 0.03 < alpha (0.05) *Hybrid grades significantly higher*				0.06173**	0.03087
* ANOVA *p-value* < 0.05 Equal Variance Not Assumed ** ANOVA *p-value* >= 0.05 Equal Variance Assumed					

Table 7

Course Content	Count	Mean	Std Dev	ANOVA p-value	t test p-value
Concepts (H$_9$)					
Grades - Hybrid Sections	186	86.21	10.37		
Grades - Traditional Sections	189	86.71	10.91		
Fail to Reject Null - 0.33 > alpha (0.05) *Hybrid grades not significantly higher*				0.65001**	0.32501
Information Technology (H$_{10}$)					
Grades - Hybrid Sections	186	86.04	9.15		
Grades - Traditional Sections	189	83.86	13.70		
Reject Null - 0.04 < alpha (0.05) ***Hybrid grades significantly higher***				0.07184**	0.03592
Information Systems (H$_{11}$)					
Grades - Hybrid Sections	186	85.91	15.02		
Grades - Traditional Sections	189	81.81	20.58		
Fail to Reject Null - 0.01 < alpha (0.05) ***Hybrid grades significantly higher***				0.02841*	0.01404
Final Grade					
Grades - Hybrid Sections	62	84.86	5.11		
Grades - Traditional Sections	63	84.49	6.04		
Fail to Reject Null - 0.35 > alpha (0.05) *Hybrid grades not significantly higher*				0.70896**	0.35448
* ANOVA *p-value* < 0.05 Equal Variance Not Assumed ** ANOVA *p-value* >= 0.05 Equal Variance Assumed					

Table 8

Item	Hybrid Ave Grade	Trad Ave Grade	Statistical Conclusion
Assessments			
Assignments	88.31	85.48	***Hybrid grades significantly higher***
Group Projects	90.65	89.01	*Hybrid grades not significantly higher*
Exams	79.21	77.90	*Hybrid grades not significantly higher*
Core Competency			
Critical Thinking	86.06	84.13	***Hybrid grades significantly higher***
Ethics	85.55	85.21	*Hybrid grades not significantly higher*
Oral Communications	91.81	88.00	*Hybrid grades not significantly higher*
Teamwork	90.65	89.01	*Hybrid grades not significantly higher*
Written Communications	89.00	87.09	***Hybrid grades significantly higher***
Course Content			
Concepts	86.21	86.71	*Hybrid grades not significantly higher*
Information Technology	86.04	83.86	***Hybrid grades significantly higher***
Information Systems	85.91	81.81	***Hybrid grades significantly higher***
Final Grades	84.86	84.49	*Hybrid grades not significantly higher*