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Hybrid Learning in a Canadian College Environment

Jeffrey Waldman, Sheridan College, and Carrie E. Smith

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1 Yonge Street, Suite 2402
Toronto, ON Canada, M5E 1E5

Phone: (416) 212-3893
Fax: (416) 212-3899
Web: www.heqco.ca

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The authors would like to express their gratitude to the students of Sheridan College for sharing their insights and experiences with hybrid course delivery. We would also like to thank Mark Neumann, Sarah Plonka, Mokhtar Noka, Fenil Shah, Jay Athia and Petra Bennett for providing significant contributions to this research.

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Executive Summary

A great deal of research has been conducted and published on the topic of hybrid or “blended” learning in university settings, but relatively little has been conducted within the college environment. The purpose of this multi-method study was to identify the impact of hybrid course delivery methods on student success and course withdrawal rates, and to evaluate faculty and student experience of hybrid instruction from within the Canadian college environment.

Quantitative findings suggest that students achieved slightly lower final marks in hybrid courses as compared to the face-to-face control courses offered in the previous year, though the magnitude of this effect was very small, in the order of -1%. Further analysis revealed that students with high academic standing were successful regardless of course mode, while students with low GPAs performed slightly worse in hybrid classes. Course mode did not have an effect on withdrawal from the course, suggesting that the format does not impact course completion.

Overall both students and faculty responded positively to the hybrid format. Students enjoyed learning and engaging online, but did express concerns about reduced access to instructors and/or a sense that lectures were rushed. Open-ended survey responses and focus group feedback made clear that it is essential to provide well-defined direction and orientation to web-based tools for a hybrid course to be successful. Suggestions for improvement include providing additional technical support for students and faculty, mandatory tutorials introducing students to online tools, and hybrid course development training for faculty.

We recommend that colleges continue to develop hybrid course offerings for their students, as they do provide an excellent opportunity for independent learning and flexibility for students with busy lives. We also suggest that further research should be conducted, ideally implementing structured hybrid curriculum experiments, to better understand which online tools are most successful and to further explore why students with lower standing GPAs underperform in hybrid courses.

Introduction

Recent advancements in technology are both a boon and a challenge for the contemporary educator. Professors need to strike a balance between the technology and presentation styles they know, and those that their generally tech-savvy students have come – or will soon come – to expect. Today's higher education curricula often include or rely upon the internet as a mode of delivery. Traditional courses are often reweighted to incorporate an online supplement (web-enhanced courses), while others are given completely over the internet (fully online courses). Between these two extremes, there exists a vast continuum of possibilities for incorporating novel online methodologies into educational modules.

Hybrid or blended learning[1], which involves partnering traditional classroom-based teaching with additional independent online learning components, is a relatively recent trend and, as such, considerable diversity exists in its definition and conceptualization. Dziuban, Hartman, & Moskal (2004, p. 3) define hybrid courses as combining "face-to-face and online instruction with reduced seat time" and "should be viewed as a pedagogical approach that combines the effectiveness and socialization opportunities of the classroom with the technologically enhanced active learning possibilities of the online environment." In hybrid delivery, online activities such as online discussions, video chats, message boards, blogs, simulations and reviews replace at least 30 per cent of the required face-to-face meeting (Allen, Seaman, & Garrett, 2007). Hybrid courses are therefore distinguishable from web-enhanced courses, which are essentially face-to-face courses in which web-based technologies are used to support but not replace classroom time.

A hybrid approach to learning can be seen as offering "the best of both worlds," retaining regular face-to-face connection yet also taking advantage of the powerful tools available through online learning (Reynolds & Paulus, 2009). A 2010 meta-analysis of more than 50 studies conducted by the U.S. Department of Education, 86 per cent of which pertained to research on postsecondary students, found that "classes with online learning (whether taught completely online or hybrid) on average, produce stronger student learning outcomes than do classes with solely face-to-face instruction" and that hybrid instruction offered a larger advantage over purely face-to-face instruction than did fully online courses (U.S. Department of Education, 2010).

In recent years a substantial body of literature has been published on the topic of hybrid learning. However, the majority of this research has been conducted outside of Canada (primarily in the US) and has focused primarily on university settings. The purpose of this research was to fill this gap in the literature by exploring the impact of hybrid course offerings in a Canadian college environment.

Hybrid at Sheridan

Approximately 17,000 full-time students are enrolled annually at Sheridan College campuses in Brampton, Mississauga and Oakville (Sheridan College, 2012). During the Fall 2011 and Winter 2012 terms, 68 courses were offered throughout the college in a hybrid format (Table 1).

[1] The terms "blended" and "hybrid" are used interchangeably in the literature when describing this mode of instructional delivery.

Table 1: Sheridan College Hybrid Course Offerings in Fall 2011 and Winter 2012 by Faculty

Faculty	Number of Hybrid Courses	Target Enrolment[2]	Number of Class Sections
Faculty of Business	30	6,115	170
Faculty of Applied Science and Technology	13	696	26
Faculty of Applied Health and Community Studies	25	3,549	112

Hybrid courses at Sheridan consist of one hour of online instruction and two hours of traditional in-class instruction per week, as compared to three hours of traditional in-class instruction offered in a non-hybrid course. As previously mentioned, hybrid course can take many forms and use a variety of online tools, such as chat/discussion boards, blogs, simulations, tutorials and lecture reviews. In most cases the online components were hosted using Blackboard. Faculty members were free to choose to deliver courses in face-to-face or hybrid format, and those who opted to teach in the blended format were permitted to select any online tools that complimented their curriculum. Institutional support in translating courses to the hybrid format was offered to faculty through workshops. The Network for Innovation and Leadership in Education (NILES) department at Sheridan provides comprehensive pedagogical and technological support for faculty. The NILES curriculum development team was available to faculty to help create hybrid curricula.

As hybrid is new to Sheridan, the Faculty of Business approached NILES and Institutional Research to evaluate its hybrid classes in order to understand and improve teaching in this mode. The evaluation began with Business hybrid courses and, as promising results were obtained, the opportunity arose to expand the project to a college-wide study. For this reason the qualitative analysis (surveys and focus groups) is limited to the Faculty of Business, while the quantitative analysis in this study was conducted college-wide. The research methods and objectives were created collaboratively by NILES, Institutional Research, and the Faculty of Business.

Research Objectives

The primary focus of the study was to identify the impact of hybrid course delivery methods on student success and course withdrawal rates, and to evaluate faculty and student experiences with hybrid instruction.

The study was developed to address the following quantitative and qualitative research questions and objectives[3]:

1. Holding other factors constant, what impact does the hybrid format have on student success?

[2] "Target Enrolment" refers to the forecast enrolment used by the Office of the Registrar to create and schedule class sections. It is a close approximation to the actual enrolment.

[3] It was intended to explore whether statistics obtained from the online learning management system (e.g., the amount of time students spent logged in) could be employed to predict student success. It became apparent that this course of inquiry would require extensive time and detailed exploration. As such, it was removed from the scope of the study, but may provide a fruitful avenue for further research.

- Is student success in the hybrid environment significantly associated with student GPA or classroom withdrawal rate?
- What student characteristics and behaviours influence or interact with the hybrid learning format?

2. What specifically do students and faculty like and dislike about the hybrid model?
   - Which online tools and formats do students and faculty prefer?
   - How much online instruction do students and faculty prefer?
   - What additional training and support is required in order for the hybrid environment to be successful?

Methods

Overview of Study Design

A multi-method approach was used to collect data for the hybrid learning study. Data were collected using a combination of resources, including administrative data, surveys and focus groups.

During the Fall 2011 and Winter 2012 terms, 68 hybrid courses were identified college-wide. Of these, 49 courses were found for which a traditional face-to-face format course had been offered by the same instructor within the two prior academic years to serve as a control.[4] Multilevel modeling and two-stage least squares[5] regression were employed to analyze student record data to assess predictors of student course marks and course withdrawal. Only students who had completed at least one year of college, and therefore had a recorded postsecondary GPA, were included in this portion of the analysis.

Students who took the hybrid courses from the Sheridan College Faculty of Business in the Fall 2011 and Winter 2012 terms were also invited to participate in two surveys and a focus group to further explore student sentiment about hybrid course delivery.[6] Course instructors were asked to complete a short survey about their experience teaching in the hybrid mode.

Data Sources

1. Institutional Data
   Institutional data were obtained from Sheridan College student records, including demographic information (e.g., age, domestic versus international student status), academic information (e.g., program of study, year of study), and measures of student achievement (e.g., high school average, cumulative GPA). Complete student record data were available for 3,954 students in the hybrid courses, representing 188 sections taught by 63 instructors. The face-to-face control sample was comprised of 4,181 students taught in 183 separate class sections.

[4] Most courses that qualified had a section offered in the previous year that could be used as a control. In certain cases, non-hybrid courses offered in the Fall 2009 or Winter 2010 terms, and non-hybrid courses offered in Fall 2011 or Winter 2012 terms, were used.

[5] The two-stage-least-squares regression was used in part to measure and correct for the selection bias, a common bias observed in other hybrid studies. We could do so because Sheridan's registration system is unique. At Sheridan College, students are automatically scheduled for their courses by the institution and are then provided with a period of time during which they can change course sections. This two stage registration process (first close to random distribution, followed by selection) allows for the quantitative method to be employed. Results for Sheridan indicated that selection bias was very small (i.e., once enrolled, few students left a hybrid class section for a non-hybrid class section).

[6] This research was initiated in collaboration with the Faculty of Business. When valuable findings were obtained, the scope of the study was extended by collecting institutional data from hybrid and control courses from additional faculties.

2. Survey Data
   Survey questions were informed by research conducted at the University of Central Florida (Dziuban, Hartman, & Moskal, 2004a; Dziuban, Hartman, & Moskal, 2004b) and by Sheridan hybrid course curricula. Themes that emerged during the focus group discussions and in faculty responses helped in the interpretation of the responses to the open-ended survey questions.

Student Surveys

Two student surveys were administered in each of the Fall 2011 and Winter 2012 terms. Invitations to complete surveys were distributed electronically to the 1,629 students enrolled in the hybrid courses from the Faculty of Business. In-class presentations were made to students to review the goals of the research study, explain how their private information would be used, and to encourage participation. As an added incentive, students who completed a survey were eligible for class draw for an iPod shuffle (valued at $50). Permission was requested to access additional student information obtained from Sheridan institutional records in order to link survey responses to additional measures. Students who declined this request or did not provide a valid student identification number were still able to complete the survey and were included in analyses where it was possible to do so. Students were informed that the data collected would be kept confidential and distributed only in aggregated form such that no individual student could be identified from the results.[7]

A short beginning-of-term survey (see Appendix A) was made available in September 2011 and January 2012. In these surveys, questions were posed about student transportation to campus, estimates of the amount of time the student expected to invest in the various components of their hybrid and non-hybrid courses, and the reasons for having chosen to take a hybrid course. A total of 689 completed beginning-of-term surveys were collected, yielding a 41.2 per cent response rate.

The end-of-term surveys (see Appendix B) were distributed in November 2011 and March 2012. Included in this survey were five-point Likert-scale type questions comparing hybrid to face-to-face courses, questions regarding student intention to enrol in future hybrid courses, and open-ended questions about hybrid course delivery. The overarching goal of this survey was to get at the heart of students' perceptions and behaviours as related to having completed a hybrid structure course. A total of 343 surveys were collected, yielding a 20.5 per cent response rate. Students who enrolled in more than one hybrid course during the period of study were able to submit multiple surveys and each response was treated as an independent observation.

Faculty Surveys

Faculty feedback surveys were also distributed electronically at the end of term (November 2011 and March 2012). These surveys were comprised of six open-ended questions pertaining to likes and dislikes about teaching a class in hybrid format, administrative support of hybrid teaching, and differences in student learning experience between hybrid and traditional courses. A total of 21 completed faculty surveys were collected, for an 81 per cent response rate. We approached 20 unique instructors, six of whom taught hybrid in both the fall and winter terms and were asked to complete surveys on both occasions.

[7] These guidelines were set with consultation with Sheridan's Research Ethics Board (REB).

3. Focus Groups
   A total of five student focus group panels were organized during November 2011 and March 2012, just prior to the end-of-term surveys. Invitations to participate in focus groups were distributed via e-mail and in class sign-up sheets. Class presentations were made to explain the research study and encourage participation.[8] Focus group sessions were conducted with groups of four to 12 students and were approximately one hour in length. Focus group participants received a $5 gift certificate as an honorarium.

   Focus groups were semi-structured and moderators guided participants through a list of prepared questions over the course of the group discussion (Appendix C). Participating students were told that the purpose of the focus groups was to "help us understand your experience with a hybrid class, both positive and negative" in order to improve hybrid course delivery at Sheridan College. Interviewees were provided with informed consent forms assuring confidentiality of their comments, encouraging open and honest expression of ideas and opinions, and emphasizing that each person's experience and opinions were important to the research at hand. The focus group sessions were audiotaped and transcribed for further qualitative analysis.

Quantitative Data Analysis

Multilevel modeling, also known as hierarchical linear models or mixed models, was employed to determine which student characteristics, gathered at the institutional level, predict success, as measured by the student's final mark in the course and withdrawal from the course. An obvious complication in this design is the fact that we might expect students from the same section to be more similar to each other in their responses than students from another section, and sections taught by the same instructor will be more alike than sections taught by different instructors. This is a clear violation of the least-squares regression model assumption of independence. Multilevel models are a form of regression model in which the non-independence of observations can be addressed and accounted for, and are, for this reason, commonly employed in educational research (Snijders & Bosker, 2012). Three-level models were employed for both outcome measures, with students nested within section and sections nested within instructor.

Linear multilevel modeling was employed to predict student marks, as this was measured on a continuous scale. A generalized linear multilevel model using the binomial family with a logit link function was used to model the binary outcome pertaining to student withdrawal from the course. The primary variable of interest, course mode (hybrid or face-to-face), was converted to a dummy variable. For both outcomes, we began with a fully additive model testing for a significant effect of course mode, while including important control variables, namely student gender, age, domestic student status, full-time student status, standing GPA and high school course average. Following this, models were tested by sequentially adding interactions between course mode and each control variable. Interactions that were not significant at $\alpha = 0.05$ were not retained. Summaries of the final mixed models are available in Appendices D, F and H.

In addition to the multilevel model approach, the same outcome and predictor measures were evaluated using a two-stage least squares regression model. For these models, a binary variable was constructed indicating whether or not a student switched to or from a hybrid section following

[8] Presentations for focus groups and the end-of-term survey were combined into one session. These sessions were made to classes in the Faculty of Business.

their automatic enrolment by the Sheridan Registrar's Office. This served as an instrumental variable in the two-stage least squares regression, which adjusts for the effect of selection bias. In all cases, the final interpretation of these models was comparable to those found with the multilevel analyses. Summaries of the two-stage least square regression models are available in Appendices E, G and I.

For cross-validation purposes, the final models obtained with the institutional data were also fit using a subset of only Faculty of Business students. For this sub-sample, each faculty member was contacted to confirm that the face-to-face course selected to serve as a prior-year control was suitable (e.g., course content was not radically modified, that the course had been delivered in the face-to-face mode). In all cases, the model coefficients and interpretations were comparable to the school-wide sample, thus providing additional validation of the results.

Descriptive statistics and graphs were created to summarize survey findings and X^2 tests were used to test whether significantly more students responded in the affirmative than the negative to the various survey questions.

Qualitative Data Analysis

The student focus group transcriptions and open-ended faculty survey data were analyzed using NVivo to identify key themes in the student and faculty feedback.

The key themes derived from the focus group were used to inform the coding scheme employed in the analysis of the open-ended questions from the Fall 2011 and Winter 2012 end-of-term surveys.

Sampling Limitations

Students at Sheridan College are scheduled for their courses by the institution. They are then provided with a period of time during which they can change course sections, but very few students from either the hybrid or control sections chose to do so. As a result of this procedure, there are likely students in the sample who would not have made a conscious decision to take hybrid course had they been planning their own schedule by selecting from a course catalogue. Conversely, there may be some students who would have chosen to do so given the opportunity but are not part of the sample due to a lack of space in the hybrid courses. From the surveys remitted, 70.2 per cent of students indicated that one of the main reasons for choosing to take the course in a hybrid format was simply because it was the class to which they had been assigned. We conjecture that our sample is therefore somewhat closer to random allocation, with less selection bias than might be expected in institutions with a more traditional course registration protocol. Furthermore, the two-stage least squares regression models were employed to verify that the results obtained were consistent while correcting for selection bias.

While every effort was made to select appropriate non-hybrid courses to serve as controls, the conversion to a new and innovative mode often necessitates considerable changes to the course curriculum and scoring rubrics. Faculty members observed that it was difficult to develop hybrid courses that were matched in rigor (e.g., many hybrid classes required weekly online assignments) to non-hybrid offerings, and many students reported that their hybrid courses required more constant attention than their traditional ones. As a result, interpretation of effects on student marks must be made cautiously. Though it may be tempting to infer that a change in the average grade is reflective of improved learning outcome achievement, it could well reflect other differences between the modalities, such as course workload.

Key Findings: Quantitative Results

Student Characteristics

A summary of the demographic characteristics for the students registered in the hybrid and prior-year control face-to-face courses is provided in Table 2.

Table 2: Demographic Characteristics of Students Enrolled in Hybrid and Face-to-Face Courses

	Hybrid N = 3,954	Face-to-Face N = 4,181
Mature Students, 25+	14.9% (591)	16.0% (667)
Age (years)		
Median	20.9	20.9
Mean	22.3	22.7
SD	5.1	5.8
Gender		
Female	48.7% (1,926)	47.9% (2,001)
Male	51.3% (2,028)	52.1% (2,180)
International Students	29.4% (1,161)	27.0% (1,128)
Part-Time Students	11.1% (438)	10.3% (429)
Withdrawals	5.7% (225)	4.4% (183)
High School Average		
Median	69.8	69.5
Mean	70.3	69.9
SD	7.1	6.9
Range	50 - 98.3	50 - 96.3
Standing GPA		
Median	3.1	3.1
Mean	2.9	2.9
SD	1.0	1.0
Range	0 - 4	0 - 4
Class Size		
Median	37	37
Mean	34.3	35.8
SD	9.3	10.4
Range	7 - 54	10 - 95

Source: Sheridan College student records

Sixty-nine per cent of the hybrid course students who responded to the start-of-term survey reported that they were currently or planning to work during the term. Of those who planned on working, the median was 20 hours per week (interquartile range was between 12 and 23 hours). This confirms that some college students have considerable work commitments.

To further understand the busy lifestyles of the students, we also inquired as to their commute times on the start-of-term survey. Approximately half of the students reported travel time to campus in excess of 30 minutes (50.7%). The largest segment of students (32.8%) reported commutes of 45 to 60 minutes to campus.

Predictors of Student Success

A central goal of our research was to explore the effect of learning mode on student success, with the student's final course mark used as an indicator for this outcome. As a first approach, an additive model was fit to estimate the average effect of course delivery method on student marks, controlling for additional demographic variables (multilevel model summary in Appendix D and the corresponding two-stage least squares model is summarized in Appendix E). A small but significant average effect was found, $t(307) = -3.09$, $p < 0.001$, with students who completed the course in the hybrid mode, achieving final marks 1.2 per cent lower than those who took the course in the traditional face-to-face format. To put this value into perspective, the standard deviation of final marks was 14.7 per cent, making the decrease in final grade related to hybrid learning less than 0.1 standard deviations.

To further explore predictors associated with student success in hybrid learning, a series of models was implemented, testing for significant interactions of the covariates with course mode. While gender, age and high school average were significant predictors of course mark, none of these variables moderated the effect of course format on student success. Domestic and full-time status neither predicted course mark directly nor moderated the effect of course format on student success.

The only variable that did moderate the effect of teaching format on course grade was student cumulative GPA. At Sheridan College the possible range of GPAs is 0 to 4. Figure 1 illustrates the predicted final mark of a typical student in a hybrid course versus a typical student in a face-to-face course for various levels of GPA. At very high GPAs (e.g., 3.4+) the two lines intersect and there is little difference between the two scores. However, students with low standing GPAs demonstrated a modestly lower final mark when taking a course in the hybrid format. The difference in predicted mark between the two course delivery modes is depicted in Figure 2. Students with a standing GPA lower than 3.0 evidenced a small (less than 3%) but significant reduction in final course mark with hybrid course delivery. Again it is important to note that this decrease in final score, though significant, represents a change of approximately -0.2 standard deviations and therefore remains a small effect.

This finding deviates from the results of the 2010 meta-analysis conducted by the U.S. Department of Education, in which it was found that hybrid instruction provided a small advantage (+0.35 standard deviations) in terms of learning objectives over purely face-to-face instruction (Means, Toyama, Murphy, Bakia, & Jones, 2010). However, the majority of the studies included in this meta-analysis were conducted in university environments with either undergraduate or post-graduate students, and while a few of the studies were from elementary or secondary school systems, none appear to have been conducted in a community college environment.

Figure 1: Predicted Final Course Mark (%) varying GPA for Hybrid and Traditional Face-to-Face Course Modalities

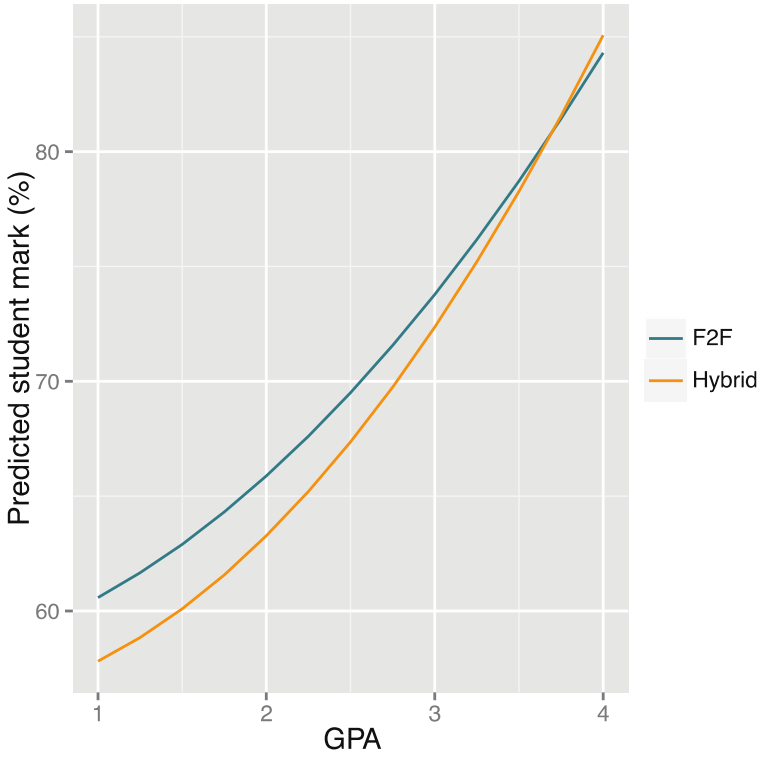
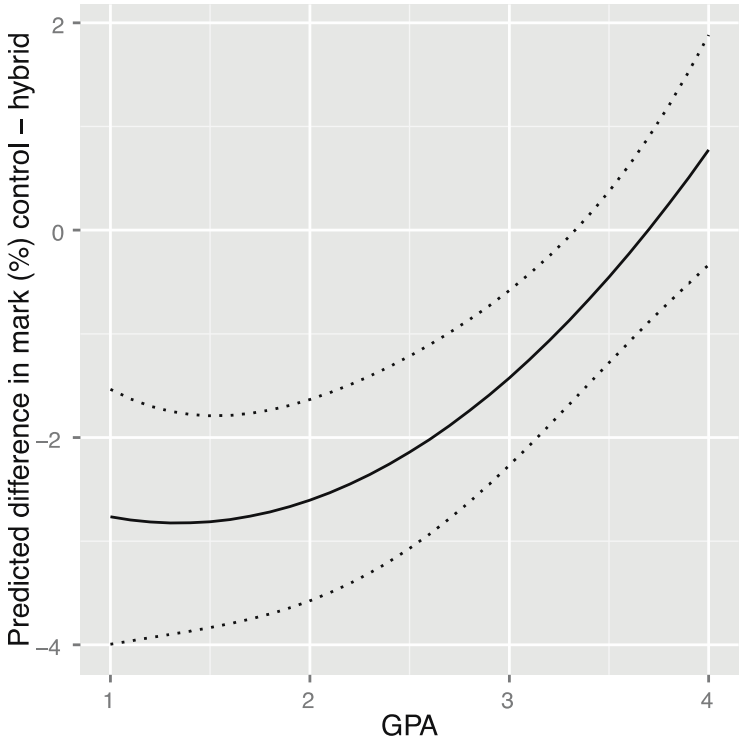


Figure 2: Predicted Reduction in Final Course Mark for Hybrid Delivery as a Function of GPA with 95% Confidence Intervals

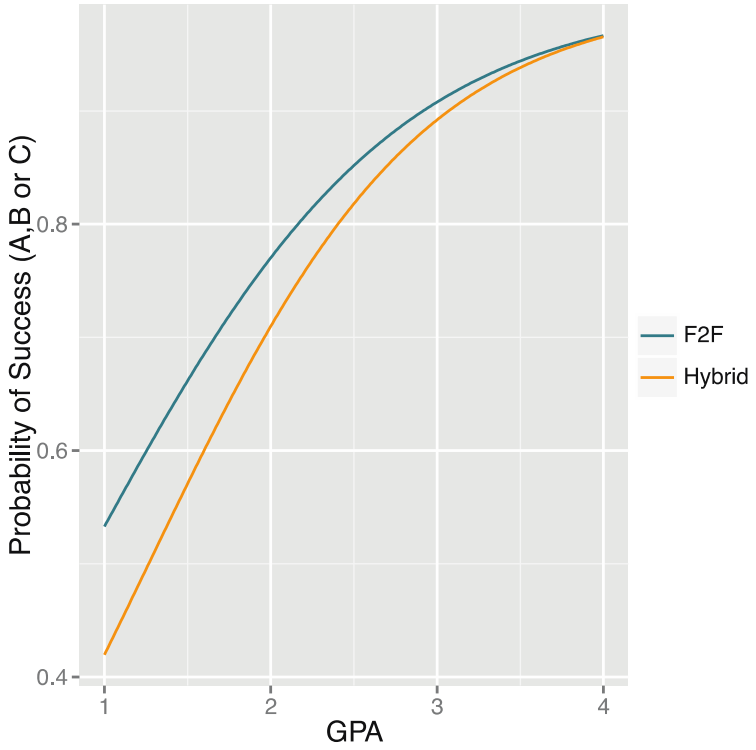


Dziuban, Moskal and Hartman (2004) reported that the percentage of students who received grades of A, B or C was as high or higher in hybrid than traditional face-to-face courses at the University of Central Florida in all six terms between spring 2001 and spring 2003. In this vein, a second analysis was conducted of the student marks in which the numeric grades were converted to a binary outcome, whereby success was defined as obtaining a final grade of C or better.

The additive models estimating the effect of course mode on the binary success outcome, controlling for demographic covariates, also revealed a small but significant decrease in the probability of success for courses delivered in the hybrid format. The average marginal effect was small, with the probability of achieving success approximately 2 to 3 per cent lower for a typical hybrid student (see Appendices F and G).

The effect of moderating variables was considered sequentially, building upon the additive model. Gender, age, high school average, domestic student status and full-time status did not interact significantly with course mode. As in the model discussed previously, only cumulative GPA served as a significant moderator for the effect of hybrid versus non-hybrid learning (see Appendix F for the full multilevel model summary). The probability of achieving a final grade of C or better was approximately 10 per cent lower for students with low GPAs who took the hybrid course, but this difference disappears for students with high cumulative GPAs (Figure 3).

Figure 3: Predicted Probability of Success in Hybrid and Traditional Face-to-Face Delivery Varying Student GPA



Predictors of Withdrawal

Another key outcome of interest was student withdrawal rates. Overall, 5.7 per cent of hybrid and 4.4 per cent of non-hybrid students ultimately withdrew from their courses.[9] Neither the multilevel logistic model (Appendix H) nor the two-stage least squares probit model (Appendix I) revealed a significant effect of course delivery method on withdrawal rates controlling for demographic and academic performance variables, nor were any significant interactions detected between course mode and the covariates.

This result is in keeping with previous research on hybrid and non-hybrid courses from the University of Central Florida, where withdrawal rates were comparable between the two groups (Dziuban et al., 2004).

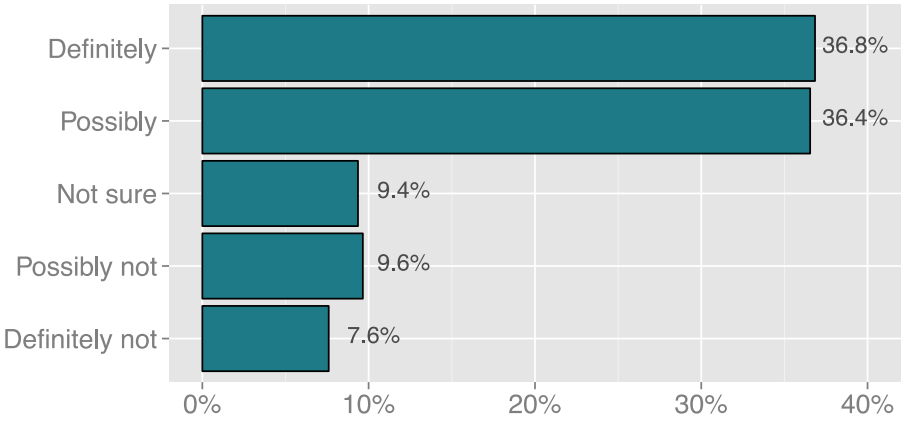
Student Survey Results: Student Satisfaction

Students reported a high level of overall satisfaction with the hybrid instructional model, with significantly more students reporting that they would enrol in a hybrid course again in the future, $X^2(1) = 118.9$, $p < 0.001$. When asked whether they would enrol in another hybrid course, a great majority (73.4%) indicated that they would possibly or definitely do so (Figure 4). A small proportion

[9] Students can withdraw from a course without academic penalty up to 30 days prior to the end of the course.

of respondents (17.3%) indicated that they would possibly or definitely not enrol in another hybrid course.

Figure 4: Given a choice, would you enroll in another hybrid course?

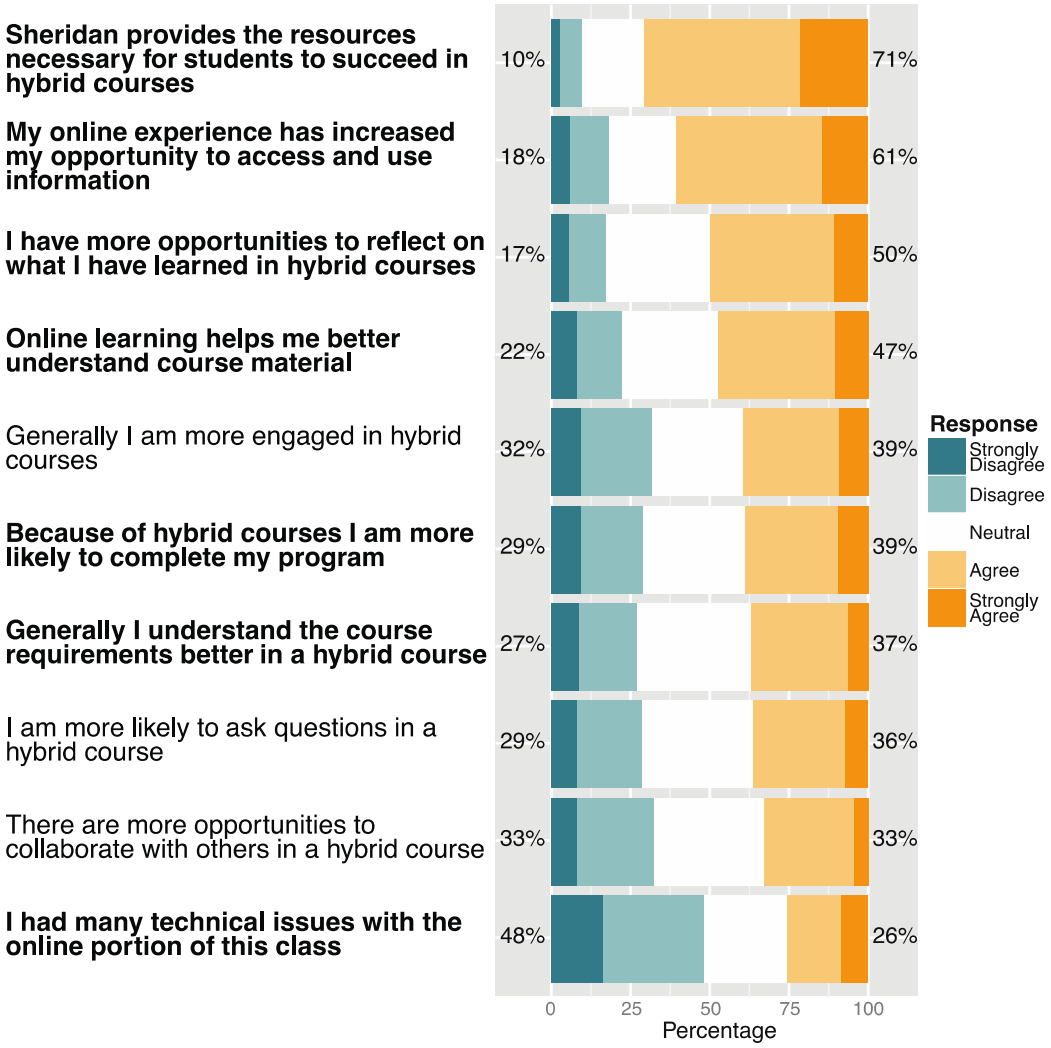


Source: Hybrid End-of-Term Survey – Fall 2011 / Winter 2012, n = 342, margin of error at 95% confidence = ± 5.3%

Figure 5 summarizes student response rates to a series of questions geared towards understanding the student experience of hybrid courses. Questions designed with a bold typeface showed a significant difference between the proportion of students who endorsed the question with an “agree” or “strongly agree” response and that of students who responded with “disagree” or “strongly disagree.”[10] Most notable from these results was the finding that 70.6 per cent of students felt that the college provided the resources necessary for students to succeed in hybrid courses, and 60.8 per cent agreed that their online experience increased their opportunity to access and use information.

[10] All comparisons were conducted using X^2 tests, with an $\alpha = .05$.

Figure 5: Collection of Questions Pertaining to Student Experience in Hybrid Courses



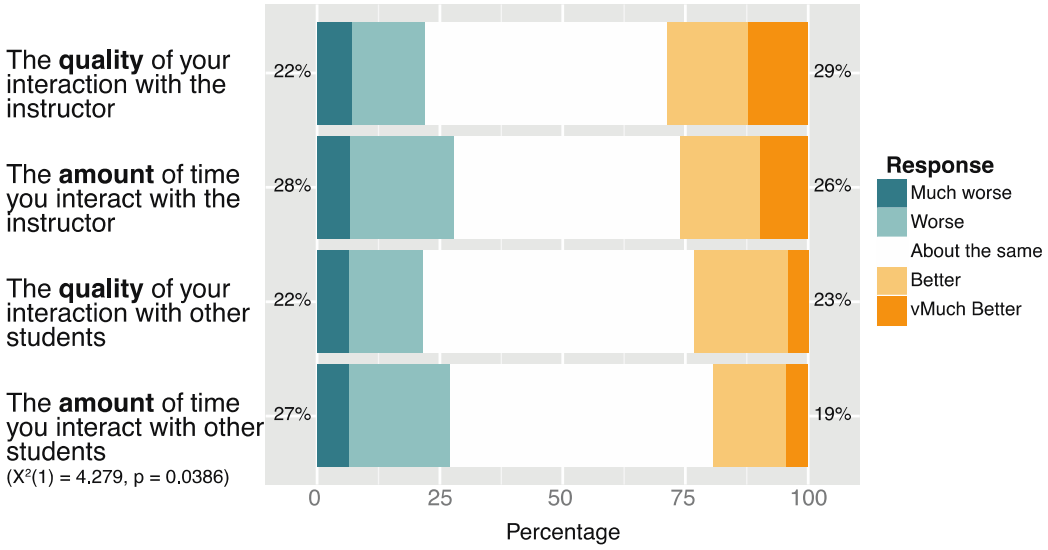
Source: Hybrid End-of-Term Survey – Fall 2011 / Winter 2012, n = 334, margin of error at 95% confidence = ± 5.4%. Questions in bold showed significant difference ($p < 0.05$) in the number of positive versus negative responses by X^2 test.

When asked about the quality and amount of interaction students had with instructors and classmates in hybrid courses relative to more traditional face-to-face environments, the majority of respondents felt that the course was about the same (Figure 6). While students were more likely to report that the amount of time spent interacting with other students was worse in hybrid courses, $X^2(1) = 4.279$, $p = 0.0386$, this reduction of time did not seem to affect the quality of the interaction, $X^2(1) = 0.1656$, $p = 0.6841$.

More divisively, 28.7 per cent of respondents felt that the quality of their interactions with their instructors was better in a hybrid classroom, while 21.9 per cent responded that it was worse. This split was non-significant, $X^2(1) = 3.09$, $p = 0.0786$. Opinions were similarly divided in regard to

assessing the amount of time spent interacting with the instructor between the two modes, $X^2(1) = 0.1978$, $p = 0.6565$.

Figure 6: How do you feel the online component of your hybrid class affects the following, when compared with your face-to-face classes?

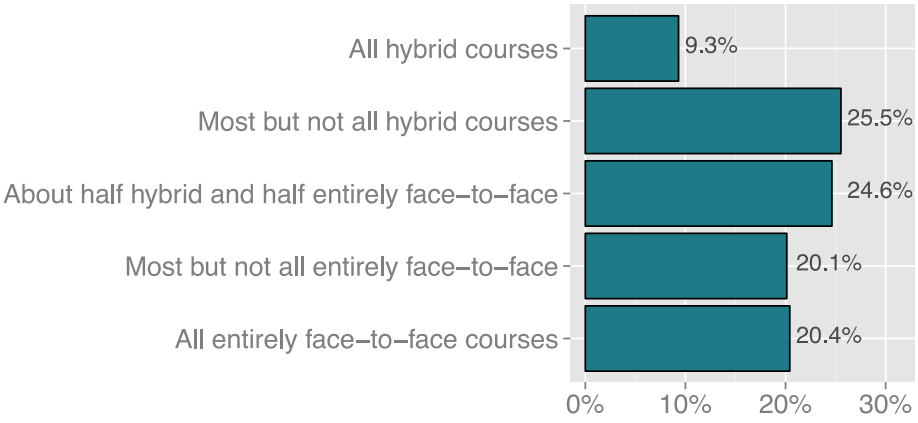


Source: Hybrid End-of-Term Survey – Fall 2011, Winter 2012, $n = 334$, margin of error at 95% confidence = ± 5.4%

Student Survey Results: Preferred Blend

When asked how many of their courses they would like to take in a hybrid format in the future (Figure 7), only 20.4 per cent of student respondents indicated they would opt to take only face-to-face classes. The bulk of student respondents (79.6%) indicated an interest in some combination of hybrid and face-to-face courses, and 59.5 per cent indicated that they would like at least half of their courses to be delivered in the hybrid format in future terms.

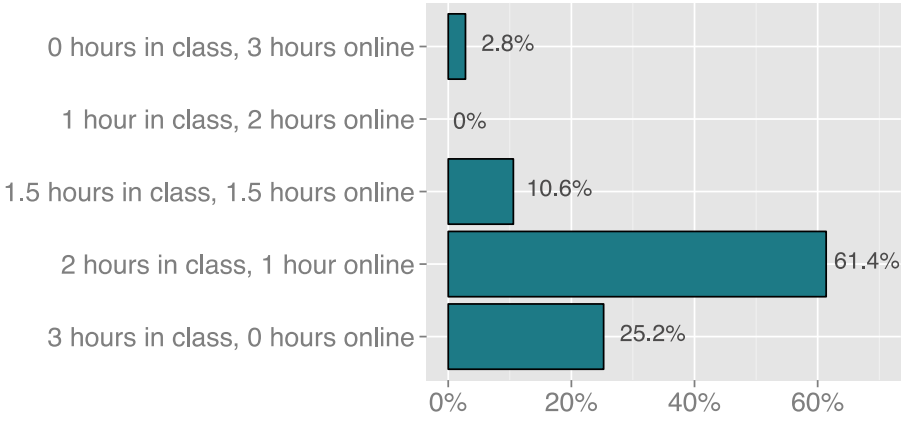
Figure 7: In future terms, how many of your courses would you like to take in a hybrid format?



Source: Hybrid End-of-Term Survey – Fall 2011 / Winter 2012, *n* = 333, margin of error at 95% confidence = ± 5.4%

A large majority of the hybrid learning students felt that two hours in class and one hour online was the optimal blend for their course (61.4%). Fewer than 3 per cent of respondents felt that the course would be better had it been offered entirely online, and less than 15 per cent of students felt that the course would have been improved by decreasing the amount of classroom time. One-quarter (25.2%) of respondents indicated that the course would be improved had it been delivered entirely face-to-face, with three full hours of in-class lecture time.

Figure 8: In your opinion, what do you think would be the best online/in-class mix for this class (per week)?

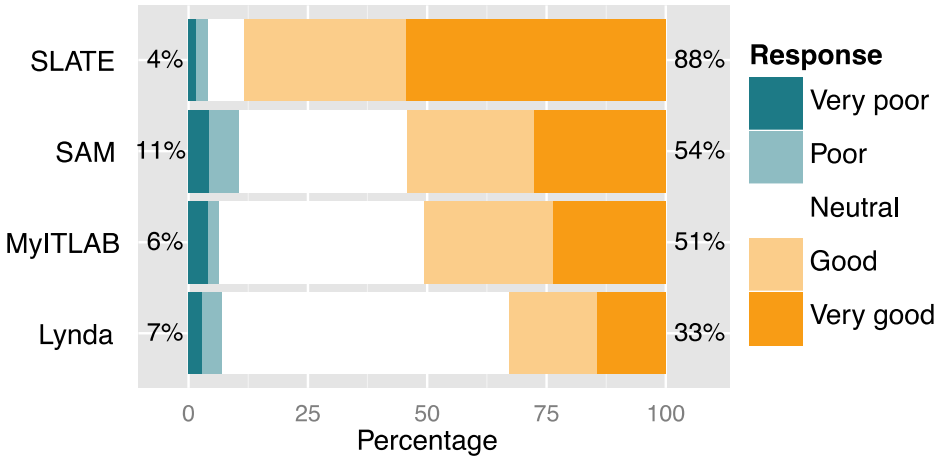


Source: Hybrid End-of-Term Survey – Fall 2011 / Winter 2012, *n* = 321, margin of error at 95% confidence = ± 5.5%

Student Survey Results: Online Tools

As the instructors who elected to offer their courses using a hybrid mode were free to select any online tool(s) they felt best served their class, the tools employed were highly variable. In the end-of-term surveys, students were asked explicitly about their experiences using the four most common platforms.

Figure 9: Please rate your experience (e.g., number of technical problems, ability to navigate and find what you are looking for, look and feel of the site, response time) using the following platforms:



Source: Hybrid End-of-Term Survey – Fall 2011 / Winter 2012

SLATE (Sheridan Learning and Teaching Environment, http://vista.sheridaninstitute.ca) is a custom learning management system published by the Blackboard Corporation. The application allows instructors to set up online discussion boards, deliver quizzes online, manage online submission of assignments and share documents with students. A significant proportion of students reported that the SLATE course management system was good or very good (88.4%, n = 320), while only a small minority (4.1%,, n = 320) responded that they felt the online tool was poor or very poor, $X^2(1) = 246.3$, $p < 0.001$.

MyITLAB is a learning management system produced by Pearson Education, with a focus on "online assessment and training for Microsoft Office Applications and Computer Concepts" (http://www.myitlab.com). Instructors can use MyITLAB to deliver training exercises, assignments and quizzes. The application provides real-time simulation of the software the students are learning. Only 6.5 per cent of students responded negatively about this online tool (n = 170), while 50.6 per cent responded positively (n = 170). Overall, this also reflects significantly more positive than negative responses, $X^2(1) = 58.0$, $p < 0.001$.

SAM, produced by CENGAGE Learning, is also a learning management system that provides simulations for training and testing for Microsoft Office Applications (http://www.cengage.com/samcentral/SAM2010.html). The majority of students who used this tool in their hybrid course rated it as good or very good (54.3%, n = 188), while 10.6 per cent rated it as poor or very poor (10.6%, n = 188). SAM also garnered significantly more positive than negative responses, $X^2(1) = 55.1$, $p < 0.001$.

The fourth commonly employed online tool was Lynda (http://www.lynda.com), a library of video tutorials teaching the use of software applications and computer programming. In contrast to the other three online tools, Lynda does not provide support for student assessment, such as quizzes and assignments. Of the 140 students who responded to this survey item, 32.9 per cent indicated that the tool was good or very good while only 7.1 per cent felt that it was poor or very poor, $X^2(1) = 23.1$, $p < 0.001$.

Taken as a group, these results indicate that students do appreciate the incorporation of novel technologies into their curricula. These tools allow instructors to test their students in engaging fashions, which mimic real world applications – a sensation that might have been impossible to convey using traditional pen and paper testing methods.

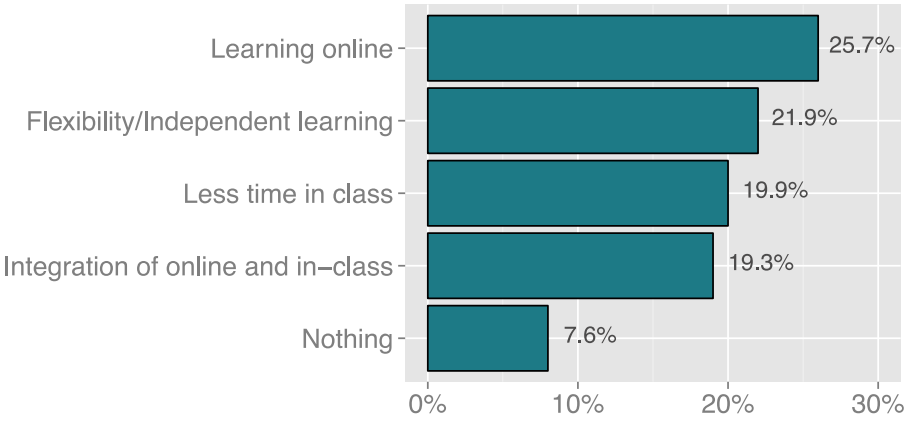
Key Findings: Qualitative Results

Student Perceptions: Open-Ended Survey Responses

Liked Most

Students were asked in an open-response question about what they liked most about the hybrid format of their class. Comments tended toward four main themes: learning and engaging online, the flexibility and independence inherent in online work, the benefits of a balance between online and in-class methods, and, finally, the variation in (or, more specifically, the minimization of) the amount of time required to be spent in the classroom (Figure 10). In our analysis, responses were coded by theme and each student was allowed to provide multiple reasons for liking the course format.

Figure 10: What did you like most about the hybrid teaching format in this class? (more than one response permitted)



Source: Hybrid End-of-Term Survey – Fall 2011, Winter 2012, n = 342, margin of error at 95% confidence = ± 5.3%

Comments about learning and engaging online drew the most responses (25.7%). Students noted that they simply liked doing work online, with remarks such as, “I enjoy being taught online” and “I prefer learning online.” Students felt that their online work had enhanced their Internet skills, particularly when conducting Internet research. As one student noted, “It increases your skills in using online books and browsing.” This increase in technical ability was often noted in connection to graded online discussion boards, a format chosen by some instructors as the online component of

their hybrid course. Students reported that having the time to think about and research answers online before participating in a discussion meant that they were able to make more valuable contributions to the subject at hand, as illustrated by the following responses:

> [It] gives me time to research, reflect and develop my position about the topic under discussion. This way I... found very interesting articles, information, and found the power of internet [sic] I did not realize before and also I have the chance [to] develop and express my own idea in my way.

> It allowed me to really learn beyond my normal scope. Usually in class I can only gain as much as I am taught by the professor. Through textbooks it's [sic] the same... However, with hybrid I can engage in discussion, search the internet to build my responses, and really get great feedback that helps facilitate my learning further.

Respondents also noted that the discussion boards encouraged engagement in the course through interaction between classmates. Students indicated that online forums provided a comfortable space to offer perspectives that might not otherwise have been shared:

> There is an opportunity to discuss with classmates in an informal way. Some students do not speak often in class and the online discussion gives them an opportunity to discuss their thoughts and opinions and therefore allows us to communicate more, where the opportunity before wouldn't have been available. There is more collaboration and more opportunity to gain differing perspectives on a matter.

> The... thing I like about the hybrid teaching format is that students are able to come together, formulate ideas and post it online so other students are able to see it. It allows other perspectives to be seen, but at the same time students are learning [and] reading other discussions.

> It gave us the chance to look into different aspects of what we had been learning and converse with each other with the weekly discussion boards. We were taught the basic knowledge and then allowed and encouraged to dig deeper.

Flexible timeframes and study options as well as the ability to work independently were noted by 21.9 per cent of Faculty of Business respondents as a feature that they appreciated. Many respondents simply stated that they liked the freedom of being able to choose when and where they would complete their work. Comments such as these were typical:

> It was nice to be able to do the work on your own schedule when it was convenient for you.

> The flexibility of studying anywhere, anytime of the school week [was appreciated].

For students with obligations beyond their academic pursuits, the online component of the course meant more flexibility overall in their lives:

> I enjoyed that the course gave me a little more freedom, therefore, allowing me to go to work earlier and completing my homework later in the week.

> [A hybrid format…] gives flexibility to students with busy schedules.

Some professors offered a particular form of online training via tutorials or simulations. These also garnered many positive comments. A feature appreciated by many respondents was the ability to repeat examples as often as was required to fully grasp course material. As one respondent observed:

> It gave me the tools and resources to practice practical application questions at home and I could repeat as many times as necessary.

Many students reported that they enjoyed the chance to complete work at their own pace. For students who work at a faster pace, saving time overall was attractive. One student noted, “It gives me the opportunity to work at my own pace. I get through the material much faster on my own.” This comment was supported by another student who appreciated that he didn’t “need to wait for others to move… [on to the] next chapter.” Other students felt that the online component allowed them to comfortably slow down and repeat portions of the lesson when necessary without impacting their classmates.

Less time spent in class was the third most common theme among the open-ended responses (19.9%). Many comments were as concise as “shorter class times” and “less time in class.” When students explained themselves further, a variety of reasons surfaced. Students noted that a shorter class often meant that lessons were more concise and to the point, as in suggestions that “time is used more wisely in class” and “that [the lectures were] straight forward and to the point. There was less time to get... off topic.”

Less time in class also meant that students could choose to learn in comfortable and convenient environments, such as their homes, and could free up time to work. Students indicated that they were able to spend “less time in class and more time… [getting] work done” since “it gave me more time at home and eliminated travel time to and from the college.”

A few students also indicated that shorter class times meant that they could better maintain focus:

> I liked that the course was shorter, sometimes three hours is too long to pay attention for the entire time.

Nineteen per cent of respondents appreciated that the hybrid course integrated online tools with in-class pedagogies. The dual nature of a hybrid course meant that lecture material was taught in manageable blocks, sized for the accompanying online work, and online material reinforced the important messages from lectures. Students also felt that the online portion improved the availability of necessary information.

> [The student] can learn in class and then apply it to the assignments/labs etc... the practical application lets me understand the theory.

> I like that we are given work to be completed at home, it really ensures that we know what we are doing and allows us to apply what was taught in class.

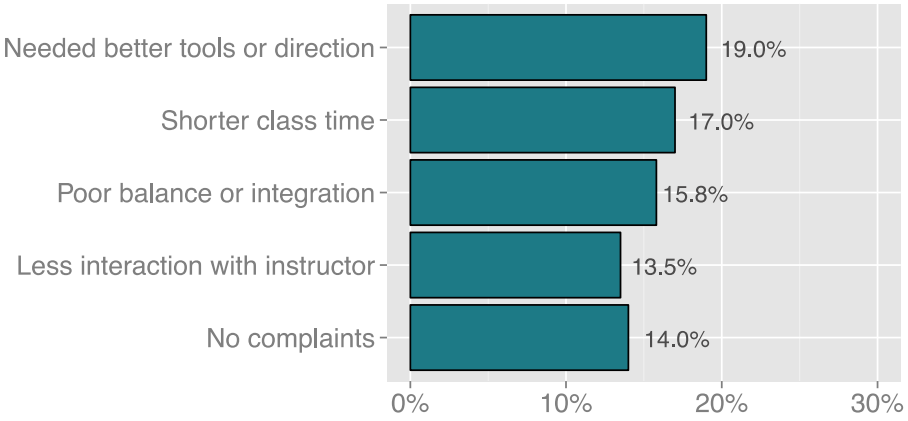
> I found that the necessary learning material was delivered in the 2-hour class. Then by committing at least an hour to review and completing the unit questions sometime during the week on your own time, you could be very successful without the extra hour in class.

Contrarily, approximately 8 per cent of respondents indicated explicitly that they had nothing positive to say about hybrid learning.

Liked Least

On the end-of-term survey, students were also given an opportunity to provide an open- ended response to the question "what did you like least about the hybrid teaching format in this class?" Again, four main themes emerged from the responses: that the course needed better tools and/or direction, shorter class times, poor balance or integration of materials, and less time spent with the instructor (Figure 11). Again, students were allowed to provide more than one response to the question. There was less consistency in the 'liked least' responses, with almost twice as many students (14.0%) indicating explicitly that they had nothing negative to say about the mode as the number of students (7.6%) who had nothing positive to report on the previous question.

Figure 11: What did you like least about the hybrid teaching format in this class? (more than one response permitted)



Source: Hybrid End-of-Term Survey – Fall 2011, Winter 2012, *n* = 342, margin of error at 95% confidence = ± 5.3%

When asked what they liked least about their hybrid course, 19.0 per cent of students indicated that they required either better tools or better direction to complete the online component of their hybrid courses. Students who provided this reply indicated that they experienced technical difficulties with the course websites that would lead them to become discouraged. Some also pointed out that they could only complete their work when they had Internet access, which indicates that some students still may not have adequate access to the web to succeed when a large component of a class is delivered online. Some students also described being unclear about how to complete their web assignments or what was required of them in order to achieve high marks for their online work.

Almost as many students responded that less time in class was what they liked least about their hybrid course (17.0%) as had indicated that it was what they liked most (19.9%). Many of these respondents said that, due to the limited classroom time, the instructors were forced to move too quickly through lecture material or that they did not receive enough instruction. Responses such as these were typical:

> The material in class feels rushed. I felt that we spent 2 hours on theory and all the practical work was left to teach ourselves.

> The least thing I liked about the hybrid teaching format is that we only had 2 hours of in class which was very little time to grasp the lesson. I found that by the time the teacher reviewed last week's lesson, he had no time to teach the current week's.

The next most common issue (15.8%) raised by student respondents was that their hybrid course was poorly balanced, that there was poor integration of online and in-class material, or that the online component of their course was not beneficial. Of these respondents, many suggested that the online activities felt “redundant” or “pointless.” This reinforces the idea that the relevance and value of web-delivered course content needs to be carefully evaluated by instructors and the reasoning for its inclusion should be expressed clearly to the students.

> There was absolutely no added value to having an online discussion because there was no incentive to read others discussion posts or debate with students about their opinions. We merely posted our opinions to the discussion question and I got no value from that.

> The online portion was inconvenient and useless; I did not learn anything from the online modules.

> I didn't understand what was considered online instruction as the online portion of the class was reading the online textbook and notes. For this particular class it just felt like an hour less of teaching and more independent work to teach myself the course material.

> The textbook links posted on-line were mostly unhelpful and students in general felt overwhelmed, frustrated, and alone. Where was the 'one-hour of online instruction'? It certainly didn't apply to our class.

With regard to poor balance, some students also felt that the online components were particularly time consuming and as a result the workload for the course felt especially high relative to traditional face-to-face courses.

> I didn't feel that as much focus was placed on it as should have been. We were required to comment on a question through discussion on [the website]. It was good people participated but [it] flooded… [my inbox] with notifications of posts. Some posts were very long and it took forever to read and keep up with everyone’s points of view.

> The length of time needed to go through the tutorials and understand the information [the point of a class], went over the allotted one-hour online portion. This significantly [lengthened] the course requirements as no online teachers were around to explain/clarify grey areas.

Additionally 13.5 per cent of respondents indicated that due to the reduced classroom time they felt that they did not have enough access to their instructors and/or responses to communication were slow. These students felt that they were not benefitting as fully from their teachers’ experience.

> [Online learning] takes away from the learning experience. Rather [than use the] time for teachers to expand on their knowledge and [answer] student questions, the classes [were] more straight to the point and finished before you know it.

> When running into trouble with course content you couldn't speak with the instructor face to face until next class.

Student Perceptions: Focus Group Results

The focus group sessions provided an opportunity for students to express their opinions and share their experiences with hybrid learning with a group of their peers. This qualitative component was aimed at investigating what positive perceptions students had about their hybrid courses, what challenges they felt they face, and finally what suggestions they might have to improve upon hybrid learning at Sheridan College.

Positive Perceptions

Our interview participants frequently identified the flexibility of hybrid courses and the opportunity for independent learning as the prime benefits of this pedagogical mode. The students expressed that it was easier to “catch up” in the case of absence, and that hybrid courses provided flexibility around their work schedules. Several interviewees felt that the independent work style required for success in a hybrid course was extremely useful in preparing them for success in the workplace. For instance, one student remarked:

> I think it… gets you ready for the real world, for when you go out to do your co-op… communicating with coworkers on email, and problem solving online, finding resources yourself. You're not going to run to your boss with everything. Someone's not always going to be there for you. You need start to learn how to problem solve yourself and find resources and tools that will help you for the first few years.

As was the case in the open-ended survey responses, students often cited the shorter time spent in class as appealing during these interviews. Many students felt that maintaining focus through a full three-hour lecture was challenging, and that two-hour classroom sessions were far more manageable.

Students in the focus groups also felt that the responsibilities inherent in the online components of their hybrid courses motivated their peers toward greater student engagement, both in class and online. In particular, several interviewees pointed to the online discussion forums as an important means for them to be able to express their opinions about course materials and saw them as an opportunity to learn from their peers.

Challenges

Not surprisingly, since hybrid courses rely on novel technology and programming, some were plagued with technical issues, such as incompatible web browsers, the slow loading (or failure) of web applets, log-in and payment issues, and so on. Students found that problems with course-related applications were particularly frustrating and anxiety provoking when they affected the graded exercises. Some students also felt that internet availability was a challenge for them, as service outages or poor reception could negatively impact their grades.

A primary concern was in regard to the quality of the lectures that accompanied a hybrid learning course. The students interviewed reiterated that fewer in-class hours sometimes translated into rushed lectures. Students felt that preparation on the part of the instructor was particularly important in this mode, as courses with instructors who were poorly organized often fell behind their lesson plans or were forced to rush through material. For instance, one student claimed:

> If you miss something you have to quickly catch up. Sometimes, particularly at the beginning of class she can go over it again, but as the class progresses and time is getting shorter, she will say, I'm sorry but you will have to pick it up at home.

Some students also found that the minimized class time also had another unexpected repercussion: the allocation of two hours of class time per week instead of three also reduced the amount of time they were given to write their exams. Though faculty adapted tests to the available time, students nevertheless felt increased pressure in the testing environment.

Furthermore, instructors in hybrid classrooms need to be organized and efficient even outside the classroom, as supporting material has to be posted online in a timely manner and often configured to match the lecture plan. Experiencing delays in the posting of supplementary materials was a common concern among those interviewed.

Finally, some students felt that they were not sufficiently motivated or prepared to complete the online portion of their hybrid classes. In some cases, the web-based work was either ungraded or received very limited feedback, which decreased student motivation to complete these tasks. Other students felt unclear as to what web-based training they were responsible for and felt that they did not receive adequate direction to satisfactorily meet the instructor's expectations.

Suggestions

A common suggestion for courses in general was that web-based activities that required student interaction were appreciated and that online discussion boards should be an integral part of the hybrid classroom. However, students emphasized that teacher accessibility was important to them regardless of the mode of course delivery. As such, they suggested that instructors maintain a high level of visibility and responsiveness to student questions both online and in person and that delays in responses to messages should be kept to a minimum.

Students felt that it was important for instructors to choose online materials carefully and ideally incorporate online tools that provide a large number of practice examples. Tools with user-friendly interfaces were preferable and minimized confusion.

The interviewees also felt that some faculty members were lacking the technical expertise required to properly implement a hybrid course and that training and guidance in hybrid course development should be provided by the college to improve these skills. Similarly, they also suggested that the college provide training or support services for students to prepare them to navigate or troubleshoot web-based courses. Such instruction would be critical for the success of students who have limited prior exposure to computer use. For instance, one student proposed:

> There should be a two-hour computer course just to make sure everyone is comfortable with all the functions of the computer... if something happens with your internet what should you do... I used to just hit ctrl/alt/del and run away… Even just file management, creating subfolders, I have my info for online courses organized well and it is so much easier to follow.

Overall, the comments made during the intensive focus group sessions mirrored those obtained by the more widespread surveys. Students do seem to enjoy hybrid curricula; however, crucial resources need to be in place for them to truly take advantage of the mode. Moreover, akin to reaping the benefits from a traditional course structure, the success of the hybrid classroom appears to largely stem from the characteristics of the instructor, particularly in regard to their technological familiarity and skills, dedication and organization.

Faculty Perceptions

To garner another outlook on the benefits and hardships of hybrid education, surveys were sent to the Faculty of Business hybrid course instructors. The following feedback summarizes the responses of 21 instructors to six open-ended questions that pertained to their recent experience. Many of the opinions expressed by the students in the focus groups and open-ended survey responses were also evident in the feedback received from the hybrid course instructors.

Positive Perceptions

In general, hybrid course instructors felt that the format of the courses provided excellent flexibility for their students. Faculty observed that the blended mode seemed to be well suited for students who also had considerable work and family commitments to manage outside of school. They also felt that the format allowed students to select a pace that was optimal for their individual learning needs:

> It provides an opportunity for students to work ahead, or to give them better control over their study/work schedule. Some students begin the module work immediately, while others tend to take the few weeks to complete it. This flexibility seems to be working for them.
>
> Students can work at their own pace/time for the online component. This works better for activities where some students will finish earlier than others – in the class this can become a problem while the faster students have to wait for the others to catch up.

Faculty also observed that the hybrid component encouraged students to be more creative and encouraged quieter students to be more communicative. They felt that having a mix of online and in-class discussions built confidence in their students and encouraged them to share their opinions more openly:

> [Hybrid] allows students who may not be confident in a class to speak up and express views online.
>
> Some students who are quiet in class share ideas in writing online. Students can create interesting and creative work online that is different to what they would do if only writing 'traditional' essays, reports, etc.

The faculty respondents also felt that hybrid tools helped their students to become more comfortable in their use of technology. For instance, many of the hybrid curricula had students make use of a range of software applications, practice searching and retrieving information on the web, and navigate complex web pages, in addition to the knowledge garnered by the core curriculum. Such skills and familiarity translate readily to the professional workplace environment.

Challenges

Hybrid instructors found working with less technologically able students to be particularly challenging. They reported that they were forced to sacrifice precious class time, which was already at a premium, to take up issues that arose from the online tools. These instructors felt that some students seemed to become overwhelmed by the technical requirements of the course and expressed concern about the suitability of hybrid courses for first-term college students.

Faculty members also found that the time constraints meant that they had less time to review material, provide individual support and interact directly with their students. This reduction of class time was a significant issue for many of the faculty, as they found that it often resulted in classrooms that were less personal in comparison with those that had the extra hour each week:

> Covering the material and allowing the students enough time to digest and practice what they've learned… was difficult enough when they had a three-hour lecture.
>
> After teaching so many 3-hour classes, I find the hybrid class short. I have become accustomed to time with my students either on break or while they are working on an individual/group activity. During this time I am available for individual questions or clarification. This personal interaction also allows an opportunity to become better acquainted with my students.
>
> They are not given as much time to do practice examples on their own with the instructor present to help them before they are forced to move on to the next topic. I think that for the weaker students, this format is frustrating. That they have to do an extra hour on their own can be daunting and many of them don't bother.
>
> I am not certain if students have the chance to develop the same rapport with their instructor/professor – or they feel as supported (time is tight, and we always seem rushed).

Despite the reduction in classroom time, several faculty respondents felt that the hybrid approach was more demanding of their time than traditional face-to-face classes. They felt that maintaining a presence on course websites, handling large amounts of student email, as well as managing technical problems added up to a more time-consuming workload. As one faculty member pointed out:

> Online activities require a lot more time for evaluation and feedback or students will lose interest.

Suggestions

When asked about how to best introduce students to a hybrid classroom, the faculty emphasized the importance of managing student expectations and providing a good balance between the two mediums. Furthermore, it was expressed that not all classes should be converted to a hybrid structure and that the diversity of styles could help maintain student interest. As two instructors commented:

> I believe a mix of face-to-face courses and one or two hybrids each term is the best way to encourage students to work more independently while not over whelming them with too much independent work. We need to factor in the level of maturity and the ability of students to complete work outside of the classroom specifically at the college diploma level.
>
> Sheridan should seriously take into consideration that some courses are not suited to this format unless we can stream students. [This course] is a perfect example… [as] only strong math students can handle an hour less instruction per week.

It was further indicated that the online component should be very structured, and how to navigate its features should be demonstrated to the class to avoid potential confusion. They also emphasized

that the means by which online work will be evaluated must be made very clear from the start. They also suggested that it was helpful to spend a short amount of in-class time reviewing what web-based materials students were responsible for, while taking care not to over-burden or confuse the students:

> Students may not adapt easily – explain every week what the "online" hour consists of, and how it will be evaluated. Lots of students treat it as "optional" unless you stress it.
>
> Professors need to explain students right away what is a hybrid course and what kind of online activity will be assigned to them instead of 1 in-class hour. Some students can switch to a non-hybrid class because of insufficient basic knowledge or computer skills.

Faculty also suggested that having access to more technical support would be beneficial to them, as well as receiving training in hybrid course development. Some respondents were lucky and had the experiences of other faculty members to draw upon:

> It [was] great that an experienced professor had hybridized the course before me, and I was able to get her help and advice.

However, most still desired some sort of structure to help them in the process. For instance, a system to review and receive feedback specifically tailored for hybrid online modules would be extremely beneficial. The feedback in this area really centered around the college as a community, with faculty members yearning to communicate to each other what works and what does not. For instance:

> We must work together to ensure we learn from our experience and continuously improve.
>
> Also I think we need to have additional courses where faculty learn more about hybrid and on-line curriculum and delivery to evolve the process and continuously improve it.
>
> Show relevant hybrid examples to the faculty when developing. Demonstrate what works well and what does not work well for the faculty ahead of time. Have better structured training for faculty. Demonstrate hybrid tools to use outside of the classroom. Have drop-in sessions for questions.

A final theme that arose from these surveys pertained to the students' level of familiarity with technology. Many instructors indicated that having a computer skills test pre-requisite before enrolling students in the hybrid classes would vastly increase their classroom efficiency. For example:

> I would strongly suggest… [Sheridan College] introduce a special prerequisite and computer skills test before students can choose a hybrid course.

While the tools utilized across the hybrid classrooms varied (for instance, between SLATE, MyITLAB, SAM, Lynda, and so on), they all relied on a basic foundation of technological familiarity. If registration was restricted to ensure that all of the students enrolled in a hybrid courses were up to that base level of familiarity, many of the technical issues that currently arise in the classroom would be eliminated. This, in turn, would leave more time for the instructor to focus on the important concepts of their course rather than navigating the technicalities of their chosen online tool.

Summary of Findings and Recommendations

Response to Research Questions

By acquiring data from different perspectives and utilizing a variety of both quantitative and qualitative methods, this study was meant to capture what it really means to provide a hybrid classroom environment within the context of a Canadian college. We began this report with a brief outline of the primary questions that guided our analysis. In this section, we will provide our responses to each of them, drawn from our findings.

Holding other factors constant, what impact does the hybrid format have on student success (GPA and withdrawal)?

A primary research goal was determining what impact the hybrid format has on student success, holding other factors constant. On average, students taking hybrid courses performed slightly worse than their peers in the non-hybrid prior-year control group, though the magnitude of the effect was very small. This finding is not consistent with literature based largely on hybrid learning in university settings, which suggests that hybrid learning typically offers an advantage over the fully face-to-face mode (Dziuban, Hartman, & Moskal, 2004a; Dziuban, Hartman, & Moskal, 2004b; U.S. Department of Education, 2010).

Is student success in the hybrid environment significantly associated with student GPA or classroom withdrawal rate? What student characteristics and behaviours influence or interact with the hybrid learning format?

Further exploration revealed that gender, age, domestic student status and full-time status did not moderate the effect of hybrid learning on the student success outcome measures. In other words, there was no evidence that receiving instruction in the hybrid mode affected student success differently for men versus women, older versus younger students, domestic versus international students, or full-time versus part-time students.

The only significant moderator of the effect of course mode on student success was cumulative GPA. Students with high academic standing were successful regardless of course mode. However, students with low GPAs performed slightly worse in hybrid classes. As this was an observational study, conclusions about causality should be drawn cautiously. One possible interpretation of this effect is that it is the result of lower engagement or less academic readiness. This might also explain why our findings differ from those in the previous literature, as the lowest performing students in a college sample represent a population who might be under-represented at a university. Another possibility is that the students who have low cumulative GPAs may be less adept with the use of technology or are less able to manage their time effectively. In any case, the causal mechanism for the small negative impact of hybrid mode on college student success measures requires further exploration.

While student success was affected by course mode, there was no evidence that withdrawal rates were influenced by the course delivery method. Students in hybrid courses were no more likely to withdraw than their control group counterparts, and none of the demographic and academic measures explored in this study influenced this effect.

What specifically do students and faculty like and dislike about the hybrid model?

In general, both students and faculty responded favourably to hybrid course delivery. Most students felt that the quality and amount of their interactions with instructors and other students was about the same in hybrid courses as compared to face-to-face classes, and reported that they would enrol in a hybrid course again.

Students enjoyed learning and engaging online. The dual nature of a hybrid course meant that lecture material was taught in manageable blocks and online material reinforced the important messages from lectures. Students also appreciated the flexibility that came with fewer in-class hours. Many survey respondents and interviewees had obligations beyond their academic pursuits (e.g., work and family) and the ability to choose when and where to complete the hour of online coursework was of great value to them. Students also felt that the independent learning component helped prepare them for the workplace. Faculty surveys mirrored these sentiments and added that they felt that the online component increased participation in quieter students. Faculty also felt that the independent learning component provided the opportunity for more advanced students to work ahead, while students who were struggling could spend more time repeating exercises. Students expressed that it was easier to maintain focus in shorter classes.

In terms of challenges, both faculty and students expressed concerns about reduced access to instructors and/or a sense that lectures were rushed. In a college environment in which small class sizes are the norm, the reduction in direct interaction with teachers likely feels particularly salient. Students sometimes reported feeling a lack of clarity around the online requirements of their courses. Faculty members also emphasized that providing clear direction and orientation to web-based tools was essential for a successful hybrid course. Not surprisingly, technical difficulties presented an obstacle for some. Encountering technical problems was discouraging and frustrating to students, and faculty reported wasted lecture time attempting to correct technical issues.

Which online tools and formats do students and faculty prefer?

Due to the variation in the tools used for the online component of the hybrid courses, this question could only be addressed in a very limited way. During the focus group sessions, students indicated that online discussion boards should be an integral part of the hybrid module and valued the interaction these provided.

The SLATE custom learning management system from Blackboard Corporation was particularly well received by students. This tool allows faculty to provide assessments and assignments online, as well as share course materials and host discussion boards.

Two other tools that were commonly employed in the hybrid courses included in the study were MyITLAB and SAM. Both of these provide simulations of Microsoft Office applications, allowing students to complete training modules and assessments as though they were using the software directly. These tools both garnered very positive feedback from the survey respondents.

Many of the hybrid courses focusing on software applications required that students view video tutorials produced and hosted by Lynda. While there were still far more positive than negative responses to Lynda, the feedback was less overwhelmingly positive than it was for the simulation-based tools MyITLAB and SAM.

How much online instruction do students and faculty prefer?

Most students said that they would consider enroling in another hybrid courses and that they would

like some, but not all, of their future classes to be provided in this format. Almost two-thirds of students indicated that they would like at least half of their courses to be delivered in the hybrid format in future terms.

The majority of survey respondents felt that the course they had just completed in the hybrid format had been offered with the optimal blend of online and face-to-face components, that is, one hour online and two hours in class. Only a very small number of students felt that the course would have been improved by decreasing the amount of classroom time, and even fewer felt an entirely online course would have been optimal.

What additional training and support is required?

Faculty felt that additional training in both the technology and in online course development would be beneficial. Several suggested that mentoring by faculty with experience developing hybrid courses would be helpful and that they would like to see a system in place to establish best practices around hybrid course development.

The majority of student respondents indicated that they felt that Sheridan College provided them with the resources necessary to succeed. However, faculty reported that some students struggled with the demands of learning the technology and that this put an additional burden on the instructors. Though over two-thirds of the students who responded to the end of term survey indicated that they felt the college provided the resources necessary for students to succeed in hybrid courses, many of the same students also reported a need for clearer instructions around the online work or suggested that an orientation to the required online resources should always be included at the beginning of term for such courses.

Recommendations

1. Further research should be conducted to understand why students with lower standing GPAs underperform in hybrid courses.
   - There are many possible reasons for this effect, including academic readiness, low engagement, poor technical skills, poorly managed expectations or curriculum changes.
   - A better understanding of causality would allow colleges to strategically implement solutions to help decrease this effect.

2. Further research should be conducted using structured hybrid curriculum experiments.
   - Hybrid teaching formats were extremely varied in this study, which made it difficult to identify successful online strategies. A more structured approach with a modular hybrid curriculum applied to many courses would allow for better evaluation of specific hybrid strategies.

3. Prioritize technical support and manage expectations for students.
   - Strategies may include a hybrid technical support group (supported by the library) or a technical support phone line.
   - Provide mandatory tutorials introducing online tools and testing to ensure that students have the basic computer skills necessary to succeed in a hybrid course before approving enrolment.
   - Work with campus IT support to generate a set of online tools that will be supported.
   - Wireless internet coverage on campus should be widely available to accommodate students who do not have access to reliable service elsewhere.

4. Prioritize technical support and course development support for faculty.
    - Provide technical support and training in hybrid course tools for all faculty members interested in teaching in the format.
    - Create a mechanism for sharing best practices among faculty, such as workshop seminars or a mentorship program.

5. Limit the number of hybrid courses a student can take per term at two.
    - Limiting the number of hybrid courses for which students are pre-registered is a prudent course at Sheridan given that we do not have a clear understanding as to why some students (particularly those with lower standing GPAs) are performing worse in hybrid classes. The limit of two is also in line with survey feedback suggesting that students feel approximately about half of their courses should be offered in hybrid format.

Study Limitations

First and foremost, it should be noted that only faculty members who had adopted a hybrid structure for their course were approached for comment. Since these instructors had already taken on the burden of modifying their curriculum to accommodate the hybrid model, it is reasonable to presume that, as a group, they may be more favourable toward hybrid learning than other instructors.

While it may not be feasible, future research should experimentally manipulate which instructors must adopt a hybrid approach and which maintain a traditional face-to-face classroom, in order to address issues of causality. At the very least, future research should attempt to poll not only the "converts" but also the instructors who perhaps attempted a hybrid structure and reverted back to a traditional classroom and those who looked into the prospect and decided that it was not for them.

Furthermore, differences in the curricula between hybrid and non-hybrid courses make direct comparison between the two models difficult. Any differences observed in student success may be the result of mode but could also be caused by increased/decreased workload, differences in student assessment techniques, differences in course rubrics, or even differences in the course scheduling. A fuller picture might appear if students were tracked longitudinally and if their successes both in hybrid courses and traditional courses were assessed.

Finally, if hybrid education is the way of the future, research should be conducted to determine the optimal ratio of classroom instruction to online activities. As student panel responses suggested, three hours a week of lecture and an hour of required online participation may be the most advantageous approach. This would not detract from the in-class personal interaction with the instructor but still provide the benefits of the online activities.

Conclusions

Quantitative findings suggest that students achieved slightly lower final marks in hybrid courses compared to face-to-face prior-year control courses, though the magnitude of this effect was very small, in the order of -1 per cent. Further analysis revealed that students with high academic standing were successful regardless of course mode, while students with low GPAs performed slightly worse in hybrid classes. However, course mode did not have an effect on the rate of withdrawal from the course, suggesting that the format does not impact course completion.

Overall both students and faculty responded positively to the hybrid format. Students enjoyed learning and engaging online but did express concerns about reduced access to instructors and/or a sense that lectures were rushed. Open-ended survey responses and focus group feedback made

clear that it is essential to provide clear direction and orientation to web-based tools for a hybrid course to be successful. Suggestions for improvement include providing additional technical support for students and faculty, mandatory tutorials introducing students to online and hybrid course development training for faculty.

We recommend that colleges continue to develop hybrid course offerings for their students, as they do provide an excellent opportunity for independent learning and flexibility for students with busy lives. We also suggest that further research should be conducted, ideally implementing structured hybrid curriculum experiments, to better understand which online tools are most successful and to further explore why students with lower standing GPAs underperform in hybrid courses.

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