

# Student Perceptions of Hybrid vs. Traditional Courses: A Case Study in Plant Identification

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## Abstract

Hybrid course formats provide a means of incorporating an online component into courses requiring hands-on learning. In 2009 and 2010 an herbaceous plant identification course was taught in a hybrid format at Montana State University, with the only in-class component being a weekly lab. This was the first online learning experience for more than two-thirds of the students. In 2009, 81.8% of students preferred an in-class format to this hybrid format, but in 2010 student preference for an in-class format dropped to 32.0%. While student attitudes towards the hybrid course improved between years, reasons for course format preference were constant. Most students who preferred a traditional in-class course disliked the reduced instructor contact of a hybrid course, while 76.5% of students who preferred a hybrid course favored the greater independence of this format. Preference for an in-class format was correlated with having previously taken the in-class woody plant identification course. Learning outcomes were not statistically different from when the course was taught in-class. This study demonstrates the utility of the hybrid format for a plant identification course and how student attitudes towards online learning are affected by perceived learning skills, and previous online and in-class experiences.

## Introduction

Web-based instruction provides several advantages to students, including accessibility to resources, facilitation of peer communication and collaboration, and accommodation of different learning paces and student schedules. Web-based instruction may also reduce demands on teaching resources. However, problems associated with certain learning styles (particularly dependent learners), difficulty in assessing student progress, reduced instructor contact and class discussion, and fewer hands-on activities can decrease student learning and satisfaction with web-based courses (O'Malley and McCraw, 1999; Rovai and Jordan, 2004).

Hybrid, or blended, course formats are intended to combine the advantages of both web-based and traditional in-class instruction. Results from hybrid courses have been equivocal, with some studies showing improved student satisfaction and performance (Gunter, 2001; Sanders and Morrison-Shetlar, 2001), while others have found either no difference

(Delialioglu and Yildirim, 2007; Olapiriyakul and Scher, 2006) or even reduced satisfaction, motivation and attendance (Biggs, 2006; Delialioglu, 2005; O'Malley and McCraw, 1999; Yudko et al., 2008). O'Malley and McCraw (1999) found that, in general, students preferred an in-class format, but wanted greater access to web-based instruction because they believed these courses saved them time, fit better with their schedules and enabled them to take more courses.

A major difficulty in analyzing and comparing hybrid courses is the broad range of potential variation in blending and balancing the web-based and in-class components, which can be compounded by course-dependent factors. Plant identification courses offer a challenge to web-based learning because of the necessity of student contact with plant material. In 2009 Montana State University converted a traditional in-class herbaceous plant identification (ID) course to a hybrid format. In this study we investigate student perceptions over two years of this hybrid course relative to traditional in-class courses, including a traditionally-formatted woody plant ID course.

## Methods

Montana State University teaches both woody plant ID and herbaceous plant ID courses. Woody plant ID is taught during the fall semester as a traditional in-class course, with weekly lectures, quizzes and plant identification reviews. In the spring of 2009 the herbaceous plant ID course was converted to a hybrid course format, with all lecture and supplemental materials available online, and the plant material maintained in a teaching greenhouse where it was available to students at all times. The only in-class component was a weekly lab where students took quizzes and exams, were introduced to new plant lists by three undergraduate teaching assistants, and participated in a number of lab activities. Students did not have face-to-face classroom contact with faculty instructors. Overall, course material such as plants, lecture content and student projects, and student interaction with teaching assistants, remained virtually unchanged from the previous two years (2007 and 2008) when the course was taught in a traditional manner. The same lead teaching assistant was used for both years, and thus errors in teaching manner, organization,

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and communication made in 2009 were modified in 2010.

Students enrolled in the herbaceous plant ID course were surveyed at the end of the spring 2009 semester (n=22) and spring 2010 semester (n=25). The survey consisted of 13 questions addressing student perceptions of this hybrid course relative to traditional in-class courses, course attendance, expected grade, student demographics, and whether the student had already taken the traditional woody plant identification course (Table 1). Students were allowed an opportunity to explain their answers to Question 1 (“Disregarding course content, overall, did you like the organization of this course better or worse than traditional in-class courses?”) through the option of selecting several possible justifications and also to write a brief explanation (Table 2).

Analysis of correlations among answers was performed using Fisher's Exact probability test to determine a two-sided p-value, and measure of associations between answers were determined using a Cramer's V coefficient. Differences in final mean grade distributions for years 2007-2010 were analyzed using the Tukey-Kramer multiple comparisons test. All analyses were performed with SAS for Windows v. 9.2 (SAS Institute Inc., Cary, NC) using an experiment-wise error rate of  $\alpha = 0.05$ .

## Results and Discussion

Overall, the majority of students in 2009 (81.8%) preferred an in-class format to a hybrid format, but in 2010 the preference for an in-class format dropped to 32.0% (Table 1, Q1). There was a shift in responses to questions pertaining to in-class versus hybrid courses

between 2009 and 2010 (Table 1, Q1 thru Q4). Students in 2009 were polarized in their choice of in-class versus hybrid format, whereas in 2010, more students felt they could learn in either environment, with 32% of students indifferent to the format. Overall satisfaction with the class (Q13), also shifted between 2009 (50%) and 2010 (83.3%) (Table 1).

Despite the change in course format preference between years, reasons for format preference were similar (Table 2). The most common answer to explain a preference for a traditional in-class format was dislike of the reduced instructor contact (100% in 2009 and 87.5% in 2010), and this theme carried through to the comments written for the “Other” option. These remarks, while addressing several issues, were most often fundamentally related to a lack of interaction with an instructor. The most common explanation among the students who preferred this hybrid course format was the greater independence relative to an in-class course (75% in 2009 and 77.8% in 2010).

Although the overall perception and satisfaction with this course improved in

Table 1. Responses to Student Survey for 2009 and 2010

Question	Answer Choices	2009 Overall Response (%)	2010 Overall Response (%)
Q1: Disregarding course content, overall, did you like the organization of this course better or worse than traditional in-class courses?	Better	18.2 <sup>a</sup>	36.0 <sup>a</sup>
	Worse	81.8	32.0
	Same	0.0	32.0
Q2: This course required you to work more independently than a traditional course, therefore you needed to work online and study plants in the greenhouse on your own initiative rather than on the class schedule. Did you prefer this to a more traditional class?	Yes	31.8	44.0
	No	63.6	24.0
	Indifferent	4.6	32.0
Q3: Relative to traditional courses, do you think you learned more or less in this course?	More	13.6	12.0
	Less	68.2	24.0
	Same	18.2	64.0
Q4: Relative to traditional courses, did you have a greater or lesser commitment to this course?	More	31.8	24.0
	Less	59.1	32.0
	Same	9.1	44.0
Q5: Where did you most often access the internet for this course?	Home	72.7	50.0
	Campus	27.3	50.0
	Work	0.0	0.0
Q6: How much time per week did you spend online for this course?	less than 1hr	13.6	20.8
	1-2 hrs.	50.0	50.0
	2-3 hrs	36.4	29.2
	more than 3hrs	0.0	0.0
Q7: Have you taken an online course before this one?	Yes	31.8	28.0
	No	68.2	72.0
Q8: What is your academic standing?	Freshman	0.0	0.0
	Sophomore	45.5	48.0
	Junior	50.0	36.0
	Senior	4.5	16.0
Q9: What is your gender?	Male	63.6	64.0
	Female	36.4	36.0
Q10: Have you already taken Woody Plant Identification?	Yes	77.3	60.0
	No	22.7	40.0
Q11: How many labs did you miss this semester?	0-1	90.9	91.6
	2-3	9.1	4.2
	more than 3	0.0	4.2
Q12: What grade do you expect to receive in this course?	A	27.3	33.3
	A-	4.4	4.2
	B+	9.0	12.5
	B	45.3	37.5
	B-	0.0	0.0
	C+	0.0	4.2
	C	14.0	4.2
	C-	0.0	4.2
Q13: Overall, were you satisfied with this class?	Yes	50.0	83.3
	No	50.0	16.7

<sup>a</sup>n = 22 (2009) and n = 25 (2010). Students were given the opportunity to explain this answer to Question 1 in more detail, see Table 2.

## Student Perceptions

the second year of the course offering, they were nevertheless much lower than the traditional in-class woody plant ID course. This is consistent with other studies that found student learning is similar between

online and in-class formats, but that students are generally less satisfied with the online learning experience (Carr 2000; Kim and Bonk, 2006; Rivera et al., 2003; Summers et al., 2005; Teclehaimanot et al., 2007). An important part of the learning experience for many students is classroom discussion, which has been correlated with both student success and course satisfaction (Nath and Anderson, 2007; VanDeWeghe, 2005; Voelkl, 1995). Maki and Maki (2003) concluded that students who enjoyed classroom discussion performed significantly poorer in online courses. Among students who preferred an in-class format in this study, only 33.3% in 2009 and 25.0% in 2010 indicated that they missed classroom discussion in this hybrid course.

Four correlations were significant across both years: Q1 + Q2, Q1 + Q13, Q3 + Q10, and Q12 + Q13 (Table 3). The correlation between Q1 and Q2 demonstrated the relationship between student dislike of working independently and dislike for the hybrid course format. A positive correlation between Q1 and Q13 in both years indicated students preferring the hybrid course were also satisfied with the class in general. Across both years, of the students preferring a traditional course, 44.4% expressed overall satisfaction with this hybrid course, while 100% of the students who preferred a hybrid course indicated overall satisfaction with the course. The correlation between Q3 (Did you learn more or less in this course?) and Q10 (having previously taken woody plant ID) changed from being negative in 2009 to positive in 2010 due to a greater number of students answering 'Same' to Q3 in 2010. However, the percentage of students answering

**Table 2. Student Explanations for Answers to Question 1 of Survey for 2009 and 2010**

Q1: Disregarding course content, overall, did you like the organization of this course better or worse than traditional in-class courses?	2009 Percent of Possible Responses <sup>z</sup>	2010 Percent of Possible Responses <sup>z</sup>
<b>If answer to Question 1 was Better:</b>		
more independence relative to traditional courses	75.0	77.8
less interaction with peers	25.0	11.1
less contact with instructor	0.0	0.0
Other	25.0	22.2
<b>If answer to Question 1 was Worse:</b>		
less contact with instructor	100.0	87.5
more independence	16.7	0.0
less interaction with peers	5.6	0.0
my self-motivation and self-discipline were lacking	27.8	12.5
I missed classroom discussion	33.3	25.0
Other	72.2	62.5

<sup>z</sup> n = 22 (2009) and n = 25 (2010). Percentages total more than 100 because students could choose all answers that apply.

**Table 3. Correlations among Student Survey Answers for 2009 and 2010**

2009 <sup>z</sup>	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
<b>Q2</b>	0.690*											
<b>Q3</b>	0.316	0.388										
<b>Q4</b>	0.105	0.303	0.112									
<b>Q5</b>	-0.241	-0.020	0.239	-0.303								
<b>Q6</b>	0.170	0.102	0.327	0.392	0.059							
<b>Q7</b>	-0.069	0.162	-0.316	0.121	-0.239	0.325						
<b>Q8</b>	0.483	0.321	-0.357	0.400	0.274	0.227	0.200					
<b>Q9</b>	0.111	0.111	0.051	-0.043	-0.039	0.310	0.111	0.433				
<b>Q10</b>	-	-0.328	-	-0.157	0.155	0.513*	-0.095	0.403	0.041			
<b>Q11</b>	0.588*	0.149	0.216	0.158	-0.105	0.516	0.137	-0.123	0.071	0.090	-0.172	
<b>Q12</b>	0.366	0.549	0.283	0.542	0.524	0.495	0.505	0.353	0.549	0.516	0.486	
<b>Q13</b>	0.471*	0.488*	0.447	0.179	0.000	0.274	-0.098	0.318	-0.189	-0.325	0.000	0.696*
<b>2010<sup>z</sup></b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q5</b>	<b>Q6</b>	<b>Q7</b>	<b>Q8</b>	<b>Q9</b>	<b>Q10</b>	<b>Q11</b>	<b>Q12</b>
<b>Q2</b>	0.480*											
<b>Q3</b>	0.493*	0.390										
<b>Q4</b>	0.427	0.269	0.620*									
<b>Q5</b>	0.427	0.097	0.199	0.313								
<b>Q6</b>	0.310	0.402	0.281	0.349	0.231							
<b>Q7</b>	0.147	0.070	0.231	0.172	0.014	0.511						
<b>Q8</b>	0.239	0.053	0.228	0.251	0.161	0.482*	0.310					
<b>Q9</b>	0.168	0.186	0.436	0.378	0.175	0.567*	-0.089	0.224				
<b>Q10</b>	0.456	0.213	0.482*	0.271	-0.066	0.373	-0.218	0.471	0.238			
<b>Q11</b>	0.275	0.269	0.165	0.232	0.255	0.292	0.174	0.275	0.389	0.389		
<b>Q12</b>	0.603*	0.501	0.513	0.493	0.535	0.561	0.558	0.565	0.521	0.391	0.279	
<b>Q13</b>	0.633*	0.433	0.775*	0.697*	-0.151	0.100	0.000	0.281	-0.346	-0.346	0.135	0.733*

<sup>z</sup> n = 22 (2009) and 25 (2010) \* indicates significance at  $\alpha = 0.05$  by Cramer's V coefficient.

'More' remained comparable (13.6% in 2009 and 12.0% in 2010).

The most interesting correlation among student responses was the bias of having taken the traditional in-class woody plant ID course prior to this hybrid course and preference for an in-class course (Q10 + Q1). In 2009 a significant negative correlation existed between answers to Q1 and Q10, strongly indicating that students who had taken the woody plant ID course preferred an in-class format. Among students who preferred an in-class format, 88.9% of them had already taken the woody plant ID course. Of the students preferring the hybrid format, only 25% had already taken the in-class woody plant ID course. The correlation between these questions was not statistically significant in 2010 (P-value = 0.10) due to the confounding effects of more students answering with a 'Same' response to Q1, however the association between woody plant ID and format preference was comparable to that of 2009: of the 2010 students that preferred an in-class format, 87.5% had already taken the traditional-format ID course, whereas of the students that preferred the hybrid format, only 33.3% had previously taken the traditional-format ID course. Of the 32% of students in 2010 who answered 'Same' to Q1, 62.5% had taken woody plant ID.

Subsequently, in 2009 a significant negative correlation also existed between responses to Q3 (Did you learn more or less in this course?) and Q10 (having previously taken woody plant ID): of the 68.2% of students indicating that they had learned less than in a traditional course, 93.3% had taken woody plant ID. In 2010 the correlation of Q3 and Q10 shifted to a positive one as more students felt they had learned the same amount in the two types of courses. Of the 24.0% that felt they had learned less than a traditional-format course in 2010, 100% had taken the in-class woody plant ID course.

Our results suggest that students who perceived themselves as independent learners were more satisfied with this hybrid format course. A positive correlation was found between responses to Q2 (preference for working independently) and Q13 (overall satisfaction with the course) in 2009. Among the 50% of students who expressed overall dissatisfaction with this hybrid course (Q13), only 9.1% indicated in Q2 that they preferred the independent initiative required of this hybrid course, while 85.7% of students who were satisfied with this course indicated a preference for working independently. In 2010 this correlation was not significant (P-value = 0.09) due to the statistical effect of a larger number of 'Indifferent' responses to Q2, although an association

was evident: 100% of students who expressed satisfaction with the hybrid course preferred working independently and none of the dissatisfied students indicated this preference.

The mean final grades for this hybrid course in 2009 and 2010 were not significantly different from the two previous years when the course was taught in an in-class format, while a significant difference did exist for final grade means between 2007 and 2008 (Table 4). In general, student satisfaction decreased as expected grade decreased in both years, which is similar to observations by other studies of online learning (Bower and Kamata, 2000; Kupczynski et al., 2010). Among the students expecting an "A" (A and A-) grade, 71.4% in 2009 and 88.9% in 2010 expressed overall satisfaction. Among students expecting a "B" grade, 50% in 2009 and 91.7% in 2010 expressed overall satisfaction. Among the students expecting a "C" grade, only 0% and 33.3% in 2009 and 2010, expressed overall satisfaction with this hybrid course.

**Table 4. Grade Means for Herbaceous Plant Identification from 2007 to 2010**

Year	Format	N	Mean <sup>z</sup>
2010	Hybrid	27	85.6 ± 2.01ab <sup>y</sup>
2009	Hybrid	23	83.8 ± 1.50 ab
2008	Traditional	30	82.9 ± 2.47 b
2007	Traditional	31	88.0 ± 1.16 a

<sup>z</sup>mean of final grades ± SEM  
<sup>y</sup>means with the same letter are not significantly different at  $\alpha = 0.05$  by the Tukey-Kramer multiple comparisons test.

While the learning outcomes between in-class and hybrid formats in this study were similar, an analysis of over one thousand empirical studies of online learning (Means et al., 2010) concluded that student outcomes were generally greater in hybrid courses than either in-class or online formats. The authors emphasized that this success should not be attributed to the media per se, but to additional learning time and instructional elements often included in hybrid courses that are not received by students in the other formats. In a comparison of in-class and online sections of the same course, Teclehaimanot et al. (2007) concluded that face-to-face encounters with instructors increased motivation for students to complete course requirements, which may be an additional advantage of hybrid vs. purely online formats. More than half of the students in our study perceived that face-to-face instructor contact helps in their ability to learn.

This was the first online learning experience for more than two-thirds of the students in this hybrid course (68.2% and 72.0% in 2009 and 2010), and of the students who had previous online experience, only 15% had taken more than one online course. Overall satisfaction rates among students who had previously taken an online course was somewhat less than students with no previous online experience in 2009 (42.9% vs. 53.3%) and identical in 2010 (83.3%).

## Student Perceptions

The lack of experience with online learning among the students participating in this hybrid course likely affected their perceptions of the format and overall satisfaction with the course. Fry (2007) found that students who had previously taken an online course were more satisfied with the online learning experience, and suggested that a student's first online course may be a "weeding out" process if students perceive they are not capable of learning in an online environment. There was no possibility for a course selection bias in our study, as it is a required course within the horticulture major and students did not have a choice between online and in-class formats. In a study that followed students through multiple online courses over a four year period, Arbaugh (2004) observed significant changes in perception occurred between the first and second times students participated in online courses. Arbaugh recommended that students should not form opinions about this medium until after taking at least two online courses. Delaying judgment of online learning may be especially important in a hands-on major such as horticulture, where student apprehensions of this medium may be heightened. In our study, overall satisfaction with the hybrid course among students with previous online experience was not greater than the mean, although more insight into this relationship would have been gained had the students been asked about their attitudes towards their prior online experience.

We believe that at least some of the improvement in student attitudes towards this course in the second year was due to small modifications in course organization and increased experience of the teaching assistants. The quality of the teaching assistants was particularly important because it was the only face-to-face instructional contact students had in this course. It is possible that had the face-to-face component been with teaching faculty, student perceptions and satisfaction would have been higher, although the amount of student interaction with teaching assistants in this course was equivalent to when it was taught in-class and to the woody plant ID course, where the primary interaction with teaching faculty was during lecture. In this regard, this hybrid course was comparable to purely online courses, where there is no regular contact with teaching faculty.

## Summary

Hybrid course formats provide a means of incorporating an online component into courses that require significant hands-on learning, such as many courses in a horticulture curriculum. This study demonstrates the utility of the hybrid format for a plant identification course and how student attitudes towards online learning are affected by perceived learning skills, and previous online and in-class experiences. Specifically, regarding one's self as an independent learner and having previously taken the in-class woody plant ID course were most associated

with satisfaction with this hybrid course and with a preference for an in-class format, respectively. The equivalent learning outcomes and lower student satisfaction relative to traditional in-class courses is consistent with the findings of other studies, and suggests that the reduced student satisfaction may be more the result of student biases than the actual efficacy of an instructional medium.

## Literature Cited

- Arbaugh, J.B. 2004. Learning to learn online: A study of perceptual changes between multiple online course experiences. *Internet and Higher Education* 7: 169-182.
- Biggs, M.J.G. 2006. Comparison of student perceptions of classroom instruction: Traditional, hybrid, and distance education. *Turkish Online Jour. of Distance Education* 7(2): 46-51.
- Bower, B.L. and A. Kamata. 2000. Factors influencing student satisfaction with online courses. *Academic Exchange* 4(3): 52-56.
- Carr, S. 2000. Online psychology instruction is effective, but not satisfying, study finds. *Chronicle of Higher Education* 46(27): 2-5.
- Delialioglu, O. 2005. Investigation of source of motivation in a hybrid course. <http://www.eric.ed.gov>. Educational Resources Information Center ED485032. CSC. (January 24, 2011).
- Delialioglu, O. and Z. Yildirim. 2007. Students' perceptions on effective dimensions of interactive learning in a blended learning environment. *Educational Technology and Society* 10(2): 133-146.
- Fry, V. 2007. Three key student satisfaction factors. *Online Classroom*. <http://www.magnapubs.com/newsletter/online-classroom>. Magna Publications. (January 24, 2011).
- Gunter, G.A. 2001. Making a difference: Using emerging technologies and teaching strategies to restructure an undergraduate technology course for pre-service teachers. *Educational Media International* 38(1): 13-20.
- Kim, K.J. and C.J. Bonk. 2006. The future of online teaching and learning in higher education: The survey says.... *Educause Quarterly* 4: 22-30.
- Kupczynski, L., M.A. Mundy, and D.J. Jones. 2010. A study of factors affecting online student success at the graduate level. *Jour. Instructional Pedagogies*. <http://www.aabri.com/jip.html>. Academic and Business Research Institute. (February 3, 2011).
- Maki, R.H. and W.S. Maki. 2003. Prediction of learning and satisfaction in web-based and lecture courses. *Jour. of Educational Computing Research* 28(3): 197-219.
- Means, B., Y. Toyama, R. Murphy, M. Bakia, and K. Jones. 2010. Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies. U.S. Department of Education, Office of Planning,

- Evaluation, and Policy Development, Policy and Program Studies Service. Washington, D.C.
- Nath, L. and L. Anderson. 2007. The effects of a classroom discussion technique on student satisfaction: A quasi-experiment. *Mountain Rise* 4(1).
- Olapiriyakul, K. and J.M. Scher. 2006. A guide to establishing hybrid learning courses: Employing information technology to create a new learning experience, and a case study. *Internet and Higher Education* 9: 287-301.
- O'Malley, J. and H. McCraw. 1999. Students perceptions of distance learning, online learning and the traditional classroom. *Online Journal of Distance Learning Administration*. *Jour. of Distance Learning Administration Database*. (March 10, 2010).
- Rivera, J.C., M.K. McAlister, and M.L. Rice. 2003. Comparison of student outcomes and satisfaction between traditional and web based course offerings. *Online Jour. of Distance Learning Education Administration* 5(3). <http://www.westga.edu/%7Edistance/ojdl/fall53/fall53.html>. University of West Georgia. (January 24, 2011).
- Rovai, A.P. and H.M. Jordan. 2004. Blended learning and sense of community: A comparative analysis with traditional and fully online graduate courses. *International Rev. of Research in Open and Distance Learning*. <http://www.irrodl.org/content/V. S.2rovai-jordan.html>. Canadian Institute of Distance Education Research. (March 10, 2010).
- Sanders, D.W. and A.I. Morrison-Shetlar. 2001. Student attitudes toward web-enhanced instruction in an introductory biology course. *Jour. of Research on Computing in Education* 33(3): 251-263.
- Summers, J.J., A. Waigandt, and T.A. Whittaker. 2005. A comparison of student achievement and satisfaction in an online versus a traditional face-to-face statistics class. *Innovative Higher Education* 29(3): 233-250.
- Teclhaimanot, B., G.A. Mentzer, and J.R. Cryan. 2007. A comparison of traditional and online classrooms: Student perceptions and learning outcomes. *Jour. Technology and Teacher Education* 15: 233-246.
- VanDeWeghe, R. 2005. Discussion-based approaches, student understanding, and student achievement. *English Matters*. 94: 99-102.
- Voelkl, K.E. 1995. School warmth, student participation, and achievement. *Jour. of Experimental Education* 63: 127-138.
- Yudko, O., R. Hirokawa, and R. Chi. 2008. Attitudes, beliefs, and attendance in a hybrid course. *Computers and Education* 50: 1217-1227.



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