College Faculty Understanding Of Hybrid Teaching Environments And Their Levels Of Trainability By Departments

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Abstract

We explored whether the knowledge of hybrid teaching (conceptions) or incorrect knowledge (misconceptions) or lack of knowledge differed among faculty from various teaching areas - education, social sciences, business, art and humanities, and math and sciences - in New York. One hundred twenty-eight faculty members responded to a test of their knowledge of hybrid learning. Using a one-way ANOVA, we found no significant differences between conceptions, misconceptions, and lack of knowledge among faculty. However, their conceptions differences approached significance ($p < .074$). We evaluated faculty levels of trainability. The results of frequency analysis suggested that professors of math and sciences, and business tended to understand more online or hybrid environments than professors of other areas did. However, professors of art and humanities, and social sciences showed high trainability scores.

Purpose of the Study

Bleed (2001) and Gould (2003) reported that institutions of higher learning would need to find new paradigms in education so that students were better prepared for the 21st Century job market. Many studies showed that there were benefits to hybrid learning courses that offered advantages over traditional face-to-face learning (Arabasz, Parani, & Fawcett, 2003; Gould, 2003; Martyn, 2003; Osguthorpe & Graham, 2003; Riffee, 2003). School reform advocates warned that the lack of student 21st Century technology were hurting the nation's role in the global marketplace (Friedman, 2006), yet few teachers integrated technology into their curriculum despite its availability (King, 2002).

The purpose of this study was to determine if faculty members within specific program or subject areas were more likely to be successful in being trained to teach hybrid courses. We studied the faculty members in education, business, social sciences, arts and humanities, and math and science regarding correct conceptions, misconceptions, and lack of knowledge about hybrid teaching.

Faculty that are comfortable with the technology necessary for hybrid or blended courses might make the transition to teaching fully online courses. In addition, students engaged in using technology in both hybrid and fully online courses will learn technology skills necessary for the 21st Century job market.

Institutions of higher learning that choose to implement hybrid or blended learning can classify faculty members into three categories: (a) those who have correct conceptions about hybrid or blended learning; (b) those who have a lack of knowledge in the area; and (c) those who have misconceptions. Many researchers report that it is more difficult to re-train faculty members with misconceptions about hybrid or blended learning, than it is to train faculty members with either a lack of knowledge or correct conceptions about hybrid or blended learning. The nation is suffering and it will continue to suffer, because students are graduating without technology skills necessary for the workplace. Students participating in hybrid or fully online courses will become familiar with workplace technology skills.

Theoretical Framework

There are many reasons why institutions of higher education might wish to expand the number of online distance learning programs and courses. For instance, Osguthorpe and Graham (2003) argued that the rationale for adopting a blended system was that it allowed for pedagogical richness, access to knowledge, social interactions, personal agency, cost-effectiveness, and ease of revision. Many colleges realize that online learning is increasing rapidly and that there will be a need to retrain faculty for this instructional paradigm.

Betts, (2009) stated, "Enrollment growth in online education now far exceeds overall higher education growth in the United States" (p. 5). Allen and Seaman (2008) reported that online enrollment increased by 12% from fall 2006 to fall 2007 while the overall higher education enrollment

increased by only 1.2%. In fall 2007, there were approximately 3.9 million students enrolled in at least one online course. It is predicted that online enrollments will continue to increase because of greater national acceptance of online education by employers, baby boomers returning to college, and a weak economy. Faculty is critical in meeting current and predicted online enrollment increases, particularly since their role extends beyond classroom instruction. Faculty members play vital roles in student engagement, retention, and long-term program sustainability.

St. Claire (1999) and Friedman (2001) believed that online courses or programs would attract more student registrations because coursework is asynchronous and might be more accessible to those with busy work schedules. St. Claire (1999) stated:

> First, web-based technology is an increasingly familiar environment for undergraduates. Second, students may be more likely to "attend" class activities when they have more control over the time and place they participate (i.e., online assignments) compared with passive lectures, which must be attended at set times and places (p. 126).

Cost-effectiveness is also a part of the discussion; Hjeltnes (2005) believed that online courses produced cost savings by using less physical college resources such as classrooms and facilities and therefore, resulted in increased profits. "Another reason for focusing on cost-effectiveness in e-learning (hybrid learning) is the fact that this kind of education is getting more and more popular. Nearly everyone will be affected by this new way of learning" (p. 5).

Hybrid courses, which substitute some online sessions for face-to-face classes, are a method of introducing faculty to the technology skills used for fully online distance courses. Westover and Westover (2014) stated,

> While the quality of online courses have [sic] continued to improve over the past decade, and while many students do quite well within the online learning environment, opponents of online learning have long argued for the continued need for the face-to-face atmosphere and interactive environment that is important in the learning process for so many students. Within the context of this pedagogical and technology tension, the hybrid course (partially online, partially face-to-face) has been born (p. 93).

Research shows that colleges see the value of and are implementing hybrid or blended learning as a method to introduce distance learning for faculty and students. However, few researchers have addressed the topic of whether the faculty understands how hybrid learning is delivered and what kinds of challenges can be found in training. Young (2002) stated "… a growing number of colleges are experimenting with 'hybrid-blended' models of teaching that replace some in-person meetings with virtual sessions" (p. 33). In addition, Scida and Saury (2006) argued that hybrid courses "… are becoming more and more the norm in higher education in the United States as earlier predictions of the explosion of completely online courses have not been borne out in practice." Young (2001) argued that hybrid classes were less controversial among university faculty members than offering traditional fully virtual courses and that "… hybrid courses may be a better way than fully online courses to help busy commuter students" (p. 33).

Teachers' satisfaction on teaching hybrid courses and by area of teaching was tested by Shea, Pickett, and Li (2005). They found that

> It appears that faculty identifying themselves as teaching courses in Math/Science, Humanities and Business/Professional Development have higher levels of satisfaction (in hybrid instruction) than those identifying themselves as teaching in the Social Sciences, Art, or "Other" categories. Given the relatively small contribution of this factor and the skewness of the members within each of the categories (e.g., only nine faculty reported teaching within the "Art" discipline area), this finding requires additional investigation and confirmation (p. 13).

When considering phasing-in the training of faculty members and in increasing the number of hybrid or blended courses, first review the group responses in program or subject areas regarding faculty member conceptions, misconceptions, and lack of knowledge about teaching online (asynchronously). Successful training to teach hybrid courses should begin with identifying misconceptions and focusing on those programs or subject areas in which there is a high incidence of correct conceptions and or a lack of knowledge about hybrid or blended courses.

There are critical predictors, which if properly identified, would likely lead many more educators to use the most advanced tools in education today. To begin, we must first define a misconception.

John Marr (2011) identified misconceptions as strongly held incorrect knowledge that resisted change and interfered with learning. This knowledge was identified, confronted through instruction, and replaced. In a critical evaluation of research on student misconceptions in science and mathematics, Smith III, di Sessa, and Rochelle (1993) found misconceptions could not simply be identified and replaced as, "... it is impossible to separate students' misconceptions, one by one, from the novice knowledge involved in expert reasoning" (p. 147). Building on available research literature, Smith III et al. (1993) concluded that misconceptions are necessary to achieve sophisticated learning. As such, "the goal of instruction should not be to exchange misconceptions for expert conceptions, but to provide the experiential basis for complex and gradual processes of conceptual change" (Smith III, 1993, p. 154).

Three critical predictors of successfully implementing technology-enhanced instruction include: (a) professional development, (b) teacher belief in technology competence, and (c) positive teacher attitude towards technology (Allsopp, McHatton, & Cranston-Gingras, 2009).

Hybrid courses and degree programs offer the best of both worlds. Osguthorpe and Graham (2003) said, "Innovative uses of technology have begun to blur the distinctions between traditional and face-to-face and more recent distance learning environments" (p. 227).

Recent technological advances have increased the overall amount of information available and improved accessibility to that information, while at the same time the costs of publishing information have decreased. These general shifts throughout society are true in education and have caused students to be more demanding and more knowledgeable about alternatives for their education. Combined with demographic trends, political forces, economic factors, the need for lifelong learning, and the changing emphases in teaching and learning, there is a resurgence of interest in distance education both at traditional institutions of higher education and in organizations whose sole mission is distance education (Dede, 1990; Knott, 1992; Lewis & Romiszowski, 1996).

Some program/subject areas may more likely to produce better results in re-training faculty. There has been little research conducted on the trainability of faculty in higher education by program subject area. Shea et al. (2005) however, found results that differed from the findings of this paper and recommended additional research in this area. This study asks the following research question: Are there differences in faculty's conceptions, misconceptions by program/subject area, about hybrid learning?

Sample

The data was part of a large study by Dr. Helen Wittmann (2006). To ease the discussion, the researchers presented a table with definitions of terms. Dr. Wittmann emailed invitations with a link to the survey, and to all faculty members at four independent institutions of higher education in New York State during the fall 2005 semester. There were one hundred and twenty eight responses (N=128). The largest number of responses came from the program area of Education (29.7%), followed by Arts and Humanities (15.6%), Social Sciences (12.5%) and Business, and Math and Science with 11.7%). Responses classified as "Other" comprised 18.8%.

Instrument and Methodology

The instrument used had two Parts; Part I was demographics (e.g. school, program or subject areas taught) and Part II, thirteen True False questions centered on hybrid (blended) courses, developed by Wittmann (2006). To see the test and the correct answers see Wittmann, 2006 page 36-40 (presented on table 3, first 4 columns).

Research Questions

This study asks the following research question:

Are there differences in faculty's conceptions, misconceptions by program/subject area, about hybrid learning?

To answer this research question, a one-way analysis of variance was performed.

Ancillary Question: Are there best program/subject areas that would lead to successful re-training of faculty for hybrid (blended) teaching?

To answer this ancillary question, an item analysis was performed for the conceptions, misconceptions, and don't know that show significance or approaching significance. In addition, the researcher will summate conceptions and don't know to evaluate the best areas to be trained.

Results

Are there differences in faculty's conceptions, misconceptions by program/subject area, about hybrid learning?

There were no significant differences between conceptions, misconceptions, and lack of knowledge among faculty in different programs/subjects. However, in the conception area, the significance level was approaching ($p = .074$). For that reason, the researchers performed a frequency item analysis to specifically detect the areas that will lead to effective training by combining conceptions and lack of knowledge. See the results in **Table 1**, the descriptive statistics and in **Table 2**, the One-Way ANOVA.

The ANOVA results show that are no significant differences between the groups of conceptions, misconceptions and no basis for knowing (don't know). However, conceptions approached significance ($p=0.074$), which can be seen as a tendency. Note **Table 2**, that faculty who work at Math/Science have the largest conception ($M=6.50$), and faculty who scored the lowest conceptions ($M=5.80$).

Are there best program/subject areas which would lead to successful re-training of faculty for hybrid (blended) teaching?

Table 3 shows the thirteen True, False and No Basis for Knowing (Don't Know) questions with responses by faculty in percentages for each question. The table also shows the number of Correct (Correct Conceptions), Incorrect (Misconceptions) and No Basis for Knowing (Don't Know) responses by program/subject area.

The True False responses were converted into Correct (Correct Conceptions) and Incorrect (Misconceptions). Research determined the correct answer for each True False question.

Table 1

Sample, Mean and Standard Deviation for Conceptions, Misconceptions and Lack of Knowledge (Don't Know) responses by faculty's program/subject area

		N	M	SD
Misconceptions	Education	39	6.97	1.78
	Humanities, Social Science	44	7.39	1.79
	Business	17	7.65	2.23
	Math & Science	28	7.29	1.30
	Total	128	7.27	1.76
Conceptions	Education	39	**5.56**	2.84
	Humanities, Social Science	44	5.93	2.52
	Business	17	6.41	2.24
	Math & Science	28	**6.50**	2.96
	Total	128	6.01	2.68
Don't Know	Education	39	3.26	3.54
	Humanities, Social Science	44	2.55	3.00
	Business	17	2.59	2.37
	Math & Science	28	2.64	3.38
	Total	128	2.79	3.17

Table 2

Analysis of Variance within and between groups for conception, misconceptions and lack of Knowledge (don't know).

		Sum of Squares	Df	Mean Square	F	*P*
Misconceptions	Between Groups	6.43	3	2.14	0.69	0.56
	Within Groups	385.00	124	3.11		
	Total	391.43	127			
Conceptions	Between Groups	17.49	3	5.83	0.81	0.07
	Within Groups	895.50	124	7.22		
	Total	912.99	127			
Don't Know	Between Groups	12.41	3	4.14	0.41	0.75
	Within Groups	1260.89	124	10.17		
	Total	1273.31	127			

Table 3

True and False answers with conversion into Correct (C), Incorrect (I) and Don't Know (DK) responses when compared to research, expressed in percentages.

						Education			Business			Arts & Humanities			Math & Science			Social Sciences		
	Question	Correct Answer	% C	% I	% DK	C	I	DK	C	I	DK	C	I	DK	C	I	DK	C	I	DK
1	Faculty time commitment is greater for hybrid learning preparation, delivery, and revision.	TRUE	81	11.9	7.2	**60.5**	18.4	21.1	66.7	26.7	6.7	55	20	25	71.4	14.3	14.3	62.5	6.25	31.25
2	Faculty members do not have complete control of his/her/their intellectual property.	TRUE	78.6	7.1	14.3	42.1	36.8	21.1	60	26.7	13.3	40	40	20	28.6	35.7	35.7	50	18.75	31.25
3	Hybrid delivery of instruction is not as effective as teaching students face-to-face.	TRUE	63	18.9	18.1	18.4	57.9	23.7	46.7	40	13.3	35	50	15	35.7	35.7	28.6	43.75	12.5	43.75
4	Hybrid teaching lacks a cohesive sense of community.	TRUE	60.6	18.1	21.3	26.3	55.3	18.4	33.3	53.3	13.3	45	35	20	35.7	42.9	21.4	56.25	18.75	25
5	I need special materials to teach hybrid courses.	TRUE	52.8	29.9	17.3	81.1	10.8	8.1	93.3	6.7	0	95	5	0	92.9	7.1	0	75	12.5	12.5
6	Adequate technical support systems are a major concern to faculty delivering hybrid courses.	FALSE	44.9	29.9	25.2	65.8	15.8	18.4	80	13.3	6.7	72	5.6	22.2	57.1	14.3	28.6	37.5	62.5	0
7	Teacher-student interaction is difficult when using hybrid learning technology to deliver instruction.	FALSE	44.9	35.4	19.7	7.9	42.1	50	20	46.7	33.3	21	31.6	47.4	35.7	7.1	57.1	18.8	12.5	68.8
8	Hybrid teaching lacks a cohesive sense of community.	FALSE	44.1	34.6	21.3	32.4	27	40.5	40	53.3	6.7	25	40	35	14.3	57.1	28.6	20	40	40

Table 3 continued																				
						Education			Business			Arts & Humanities			Math & Science			Social Sciences		
	Question	Correct Answer	% C	% I	% DK	C	I	DK	C	I	DK	C	I	DK	C	I	DK	C	I	DK
	Problems with equipment are a major concern to faculty teaching hybrid courses.																			
9		FALSE	33.9	43.3	22.8	39.5	36.8	23.7	66.7	20	13.3	45	45	10	28.6	57.1	14.3	43.8	31.3	25
	Students taught with hybrid learning perform at least as well as or better than those taught in a traditional face-to-face classroom.																			
10		TRUE	31.7	15.1	53.3	60.5	23.7	15.8	40	46.7	13.3	60	25	15	57.1	28.6	14.3	62.5	18.8	18.8
	Cheating in a hybrid course is a common threat to the quality of hybrid courses.																			
11		FALSE	30.6	37.1	32.3	10.5	73.7	15.8	20	80	0	70	20	10	28.6	64.3	7.1	25	43.8	31.3
	Students need access to a home computer with Internet access.																			
12		FALSE	21.8	71.8	6.5	5.3	84.2	10.5	13.3	86.7	0	80	15	5	7.7	92.3	0	6.3	68.8	25
	Content is better in the hybrid course.																			
13		TRUE	11.2	64.8	24	66.7	30.6	2.8	86.7	13.3	0	95	5	0	76.9	15.4	7.7	56.3	31.3	12.5
Columns 1-5, from Wittmann (2006) page 45																				

The highest percentage for each question is in bold. **Table 4** shows the following results: Social Studies had the highest percentage of correct conceptions (combined with No Basis for knowing) in 6 out of the 13 questions; Arts & Humanities had the highest percentage of correct conceptions (combined with No Basis for knowing) in 5 out of the 13 questions; Math & Science and Business had only one question with the highest percentage of correct conceptions (combined with No Basis for knowing); and Education had no question with highest percentage of correct conceptions (with No Basis for knowing).

Conclusion

Institutions of higher learning that wish to increase fully online programs and courses may consider first phasing in hybrid learning courses in program areas to acquaint faculty with the technology skills of a distance learning paradigm.

No significant differences were found in misconception and don't know of the program areas between the five schools; however in the conception area, there were some differences among the five schools ($p = .074$). In addition, we found that the retraining of faculty in technology will more likely lead to success in the program/subject areas of Social Studies, and Arts & Humanities.

There are few researchers that have evaluated differences among faculty's areas of teaching and hybrid courses. One of them was about levels of satisfaction by Shea et al. (2005). Satisfaction and motivation can be related, and at the same time affect the re-training of faculty. Morote (2004) stated, "An introductory course motivates and gives confidence to teachers to use technology." Retraining of college faculty in the use of technology may best be accomplished by increasing the number of hybrid courses. Exposing faculty to technology may improve their perceptions. Morote (2004) stated that faculty will become more comfortable with technology if they take an introductory course for the integration of technology into the curriculum. Findings indicate that training faculty for hybrid or blended courses would more likely be successful in the program areas of Social Studies and Arts & Humanities as they had the greatest correct conceptions of hybrid learning.

Table 4
Correct Conceptions with Don't Know Responses for Each of the Thirteen Questions by Program or Subject Area

	Education	Business	Arts and Humanities	Math and Science	Social Sciences
Q 1	81.58	73.33	80.00	85.71	**93.75**
Q 2	63.16	73.33	60.00	64.29	**81.25**
Q 3	42.11	60.00	50.00	64.29	**87.50**
Q 4	44.74	46.67	65.00	57.14	**81.25**
Q 5	89.19	93.33	**95.00**	92.86	87.50
Q 6	84.21	86.67	**94.44**	85.71	37.50
Q 7	57.89	53.33	68.42	**92.86**	87.50
Q 8	72.97	46.67	60.00	42.86	**94.78**
Q 9	63.16	**80.00**	55.00	42.86	68.75
Q 10	76.32	53.33	75.00	71.43	**81.25**
Q 11	26.32	20.00	**80.00**	35.71	56.25
Q 12	15.79	13.33	**85.00**	7.69	31.25
Q13	69.44	86.67	**95.00**	84.62	68.75

Colleges wishing to expand the number of online courses and programs are faced with the challenge of re-training faculty that have conceptions, misconceptions and lack of knowledge about this learning paradigm. The leaders of our colleges and universities need to embrace this transformational moment and guide their institutions to take advantage of this new technological environment. If they do not, and if higher education does not begin to stem the rising tide of college costs, our nation's higher education system risks losing the public support on which it so heavily depends (Guthrie, 2012). The misconceptions theory helps professional developers to target faculty in the areas of need, and will help to reduce costs.

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