Do Chickering and Gamson's Seven Principles Also Apply to Online MBAs?

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Abstract

Given a relative lack of empirical testing of conceptual frameworks of web-based course effectiveness, empirical testing of such frameworks is important because it can help determine similarities and/or differences in web-based and classroom-based courses. Such frameworks help determine whether and/or to what extent the training of faculty must be modified to prepare them adequately for online teaching. To assess whether conventional teaching wisdom needs to be modified for the online learning environment, we tested the applicability of a commonly-used framework, Chickering and Gamson's (1987) Seven Principles of Good Practice in Education using a sample of twenty-four online MBA courses conducted at two Midwestern U. S. schools. The results support the extension of five from the seven principles of good practice in classroom-based undergraduate education to web-based graduate education. These findings suggest that principles of effective classroom teaching may be used as a starting point for developing and teaching web-based courses.

Introduction

As online learning has become increasingly commonplace, researchers have developed theoretical models of effective web-based course and program design (Garrison, Anderson, & Archer, 2000; Rungtusanatham, Ellram, Siferd, & Salik, 2004). However, these frameworks have had limited influence on the empirical study of web-based courses. This lack of integration between conceptual and empirical work suggests that this stream of research would benefit greatly from additional tests of conceptual models of learning and/or instruction.

It is possible that already existing frameworks developed from classroom settings could be extended to predict effective practice in web-based learning environments. One of these frameworks, the Seven Principles of Good Practice in Undergraduate Education (Chickering & Gamson, 1987), was developed from a review of fifty years of educational literature. These seven principles focus on contact between students and faculty, consideration of multiple approaches to learning, and engagement of students in learning. Educators have begun considering how these principles may apply to online learning (Ehrmann, 1999) with studies examining their applicability to technologically-driven learning environments (Chickering & Ehrmann, 1996; Chizmar & Walbert, 1999). However, attempts to extend the applicability of the framework to graduate education have been limited.

This paper builds on the emerging literature of web-based education by examining whether Chickering and Gamson's (1987) seven principles of effective education can be generalized to graduate level courses. First, we review Chickering and Gamson's principles and relate them to previous work in web-based education. We then report on our study of these principles using a sample of MBA students from two universities in the midwestern U.S. We conclude the paper by discussing potential implications of these findings for online instructors and institutions.

The Seven Principles and Web-based Education

1. Good Practice Encourages Contact between Students and Faculty

The literature related to this first principle can be categorized by two variables: instructor immediacy behaviors and participant interaction. Instructor immediacy behaviors have been studied thoroughly by communication education scholars and generally have been found to be

significantly associated with student learning. Researchers have begun to extend these findings about immediacy behaviors to the distance education environment. The results of these studies suggest that student expectations and perceptions of nonverbal immediacy are lower for distance education than for traditional classrooms (Freitas, Myers, & Avtgis, 1998). However, verbal immediacy behaviors are not impacted as much by the format, and instructor immediacy behaviors have been found to be positively associated with student learning and course satisfaction (Arbaugh, 2001; Baker, 2004).

Although instructor behaviors appear to be an important influence on web-based courses (Easton, 2003; Walker, 2003), it is becoming apparent that student interaction behavior is critical for closing the interaction loop. Initial evidence suggests that the "verbal" behavior of both the students and the instructor is critical for a successful web-based graduate course (Arbaugh, 2005; Hiltz & Wellman, 1997; Swan, 2002).

2. Good Practice Develops Reciprocity and Cooperation among Students

Success in virtual environments is being attributed increasingly to collaborative efforts within and between groups (Jarvenpaa & Leidner, 1999; Palloff & Pratt, 2001). Therefore, it is not surprising that much of the literature on web-based courses supports the concept of collaborative learning (Swan, 2003). As a result of this increased emphasis on collaborative behavior, control of the learning environment in web-based courses often resides in the student peer groups.

3. Good Practice Uses Active Learning Techniques

The conclusions of several authors on distance education suggest that the lecture model may not be as effective in virtual classrooms as it is in physical ones (May & Short, 2003; Walker, 2003). Two reasons for this are the opportunity for information overload and the dynamic nature of the medium. Previous studies of electronic classrooms suggest that the volume of text-based material can be overwhelming (Berger, 1999; Hiltz & Wellman, 1997). Also, since the medium is considered to be a non-linear vehicle for instruction (Leidner & Jarvenpaa, 1995), students can supplement course material by incorporating their own web searches and personal experiences into the classroom setting at their convenience.

4. Good Practice Gives Prompt Feedback

Researchers suggest that instructors need to learn a different set of teaching skills for teaching online (Brower, 2003; Easton, 2003). A primary new skill is making the transition from being a "talking head" to being a discussion facilitator and manager (Berge, 1995). This new role includes using a more conversational style in online comments to help enhance student participation and discussion (Brower, 2003) and placing a high emphasis on providing prompt feedback to students regarding their performance on assignments and in class discussions (Arbaugh, 2001; Berger, 1999).

5. Good Practice Emphasizes Time on Task

Prior studies have shown that time on task is a strong predictor of computer-based learning (Brown, 2001). In a web-based learning environment, this attribute has been associated with spending more time in the course, logging on to the course site more frequently, and being more likely to take additional courses via the medium (Arbaugh & Duray, 2002; Hiltz, 1994). This implies that students who spend more time on a web-based course and/or who have prior experience with web-based courses are more likely to be satisfied with the experience and take more ownership of the learning process, thereby increasing their own learning.

Another aspect of the time on task dimension is the potential for increased efficiency of learning that may be provided via the online environment (DiBiase, 2004). While some raise concerns about lack of face-to-face contact in online learning settings (Flaherty, Pearce, & Rubin, 1998), students increasingly appear to either tolerate this characteristic or leverage it for new ways of building communities (Berger, 1999; Brower, 2003; Rovai, 2001).

6. Good Practice Communicates High Expectations

One assumption of collaborative learning is that it raises the bar for performance expectations (Alavi, Wheeler, & Valacich, 1995; Yoo, Kanawattanachai, & Citurs, 2002). Therefore, we expect that these increased expectations will be demonstrated in web-based courses. One way in which these higher expectations have been communicated in online courses is through the use of peer or public review of assignments (Chizmar & Walbert, 1999) because the use of electronic

documents makes it much easier to make assignments visible to other course participants (Ehrmann, 1995; 1999).

7. Good Practice Respects Diverse Talents and Ways of Learning

A number of researchers are beginning to suggest that classroom and web-based settings are fundamentally different learning environments (Berger, 1999; Shedletsky & Aitken, 2001). Media richness (Daft & Lengel, 1986) and social presence theories (Rice, 1984; Sproull & Kiesler, 1991) suggest that recreating the classroom learning environment to fit the internet in its present format would be difficult. The relatively low richness of text-based media and the elimination of non-verbal cues can make accomplishing interdependent, ambiguous tasks such as case discussions and group projects particularly challenging (Flaherty et al., 1998). Therefore, it has been suggested that instructors should supplement text with features such as videoconferencing, voice messaging, video clips and/or multimedia (Arbaugh, 2005; Benbunan-Fich, 2002).

Method

The sample for this study was taken from 24 of 26 class sections that were conducted using either Lotus LearningSpace or Blackboard course software platforms in the MBA programs of two Midwestern U.S. universities during a one-year period. Two half-semester courses completed in the first half of the Spring semester were omitted because the study was not developed in time to include them. Nearly all students in these courses also were enrolled in the universities' classroom-based MBA programs. Twelve different instructors taught the courses. Class section sizes ranged from 9 to 31 students.

Data were collected using a two-step process. Students completed a survey either in class for courses that had a final physical meeting or via e-mail for those that did not. In the second step, non-responding students were mailed a copy of the survey. Three hundred forty-one surveys were returned, of which 334 were usable, for an effective response rate of 69.6 percent (334 of 480).

We used perceived student learning and student satisfaction as the study's dependent variables since the multi-disciplinary, multi-instructor nature of the sampling frame inhibited the use of a common measure of actual learning.

- Perceived student learning was measured by using Alavi's (1994) six-item scale (Chronbach's alpha (1951) =.95).
- Student satisfaction was measured using a twelve-item scale that focussed on student satisfaction with taking the course via the internet and the likelihood of taking future courses via the internet.

A factor analysis using varimax rotation revealed that these items loaded onto two factors: (1) Satisfaction with the delivery medium (four items, Chronbach's alpha (1951) =.91); and (2) Satisfaction with the course (eight items, Chronbach's alpha (1951) =.90). These scales have been used in several studies of online management education (Alavi et al., 1995; Arbaugh, 2000; 2005; McGorry, 2003).

Although the seven principles have been operationalized anecdotally in studies of business education (Daly, 2001), there has been limited empirical measurement of them for online courses. We used a seventeen-item survey developed by the Flashlight Project (Ehrmann & Zuniga, 1997) to attempt to measure the Seven Principles since that group has been a champion of the study of whether and how the use of technology promotes these principles (Chickering & Ehrmann, 1996). However, a factor analysis with varimax rotation generated only five factors with eigenvalues above 1.0. These five factors accounted for sixty-two percent of the variance within the items. Of these five factors, only three had reliabilities at or above the recommended coefficient alpha of .70 (Nunnally, 1978). An examination of the composition of the five factors in concert with a review of the conceptualization of the seven principles suggested that the factors could be linked with adequate construct validity only to four of the seven principles. The use of measures that are both valid and reliable is fundamental to effective research (Fraenkel & Wallen, 1990). Therefore, when possible the use of multiple operationalizations of a variable is particularly helpful for establishing reliability and validity (Kidder & Judd, 1986). Since we were unable to operationalize all seven principles using the Flashlight Project's instrument, we

supplemented the factors generated with additional objective and/or survey-based measures used to measure similar constructs in previous online learning research to measure the other three principles or to provide additional support for factors that had Chronbach's alpha (1951) scores of below .70.

Two of the factors from the factor analysis were used to measure the level of contact amongst students and faculty. These factors were named student-faculty contact (five items loading at .56 or higher, coefficient alpha=.79) and perceived isolation (three items loading at .44 or higher, coefficient alpha=.60). We included the perceived isolation factor as a measure of contact amongst students and faculty because studies have shown that an absence of interaction among students and faculty results in students feeling isolated in the online environment (Hiltz & Wellman, 1997; Rovai & Wighting, 2005). The principles of developing student reciprocity and cooperation and giving prompt feedback were measured using a single factor since reliable and valid factors representing each these constructs were generated via factor analysis.

Since the factor generated that represented the principle of communicating higher expectations had a Chronbach's alpha (1951) below .7, we also used the number of times that peer evaluation was used in a course as a supplementary measure of this principle. Peer or public review of course work has been used as a measure of student-content interaction and has been associated with increased student performance in web-based courses (Chizmar & Walbert, 1999; Marks, Sibley, & Arbaugh, 2005).

There were no factors generated that represented the principles of using active learning techniques, emphasizing time on task, and respecting diverse talents and ways of learning. Therefore, we incorporated several archival measures used in previous studies of online learning to operationalize these principles. Since the use of active learning techniques has been characterized as learning in ways other than traditional examinations (Chickering & Ehrmann, 1996; Leidner & Jarvenpaa, 1995; Palloff & Pratt, 2003), we measured this principle by taking the sum of the number of non-exam performance assessments used in a course. We used two measures to operationalize the principle of emphasizing time on task. To measure the allocation of time aspect of this principle (Brown, 2001; Chickering & Ehrmann, 1996), students reported

the average minutes per week they logged on to the course site. We measured the efficiency aspect of this principle (Palloff & Pratt, 2003; Shedletsky & Aitken, 2001) using Arbaugh's (2000) eight-item measure of perceived course flexibility to assess the extent to which students perceived the medium allowing them to conduct their learning conveniently and efficiently. To measure the principle of respecting diverse talents and ways of learning (Chickering & Ehrmann, 1996), we sought measures that reflected the use of a variety of learning tools, techniques, and formats. Arbaugh (2005) measured media variety as the range of audio, video, text-based, and multimedia tools on an online course website, and found that it was a significant predictor of perceived learning. We extended this approach to include media and assessment variety to measure this principle by summing of the number of sets of lecture notes, power point presentations, audio/video clips, links to other web sites on the course site, and the number of examinations and projects used to assess learning in the course. We divided this sum of activities by the number of credit hours for each course to control for the fact that there were both half- and full-semester courses included in the study, and courses with larger credit hours are likely to have more learning assessments. A listing of our measures of the Seven Principles is provided in Table 1.

TABLE 1: Variables Used to Operationalize the Seven Principles

1. **Encourages Contact Between Students and Faculty:**
   Student-Faculty Contact (five items, alpha =.79)
   Perceived Isolation (three items, alpha =.60)

2. **Develops Reciprocity and Cooperation Among Students:**
   Collaboration (three items, alpha =.70)
   Use of Discussion Groups (dummy coding)

3. **Uses Active Learning Techniques:**
   Number of Evaluations Other than Exams

4. **Gives Prompt Feedback:**
   Feedback (three items, alpha =.74)

5. **Emphasizes Time on Task:**
   Student Usage of the Course Site (minutes per week)
   Perceived Flexibility (eight items, alpha =.88)

6. **Communicates High Expectations:**
   High Expectations (three items, alpha =.62)
   Number of assessments using peer evaluations

7. **Respects Diverse Talents and Ways of Learning:**
   Number of sets of lecture notes, power point presentations, audio/video clips and links to other web sites, examinations and course projects used in the course divided by the number of course credit hours. (Media and Assessment Variety)

Our control variables were student age, student gender (male=0, female=1), student skill level in web-based courses, student and instructor prior experience with web-based courses, whether the course was required and/or quantitative in nature, and the number of students in the course. We measured student skill level using a three-item scale of students' skills in using computers, computer keyboards, and the internet. Two dummy variables measured whether a course was required or elective and whether or not it was quantitatively-oriented.

Results

Table 2 provides descriptive statistics for the study**'s dependent, predictor, and control variables**. The variable means suggest comparable levels of perceived learning, delivery medium satisfaction, and course satisfaction. The means for the dependent variables are somewhat higher than those for any of the five independent variables generated by the items from the Flashlight instrument, for which the range of the means was between 3.93 and 4.29.

TABLE 2: Descriptive Statistics and Scale Reliabilities among Study Variables (n=334)

	Variable	Mean	SD	alpha
1.	Perceived Learning	5.16	1.20	(.95)
2.	Delivery Medium Satisfaction	4.78	1.31	(.90)
3.	Course Satisfaction	4.99	1.52	(.91)
4.	Student Age	31.26	6.20	(NA)
5.	Student Gender	0.41	0.49	(NA)
6.	Student Skill Level	5.93	1.07	(.93)
7.	Online Course Experience	1.92	1.89	(NA)
8.	Instructor Experience	3.89	4.03	(NA)

9. Required Course	0.72	0.45	(NA)
10. Quantitative Course	0.44	0.50	(NA)
11. Class Section Size	24.36	4.81	(NA)
12. Student/Faculty Contact	4.29	0.96	(.80)
13. Perceived Isolation	4.20	1.11	(.60)
14. Collaboration	3.93	1.05	(.70)
15. Non-exam Evaluations	2.14	1.28	(NA)
16. Feedback	4.06	1.12	(.74)
17. High Expectations	4.26	0.82	(.62)
18. Peer Evaluations	0.50	0.92	(NA)
19. Student Usage	234.93	192.64	(NA)
20. Perceived Flexibility	5.35	1.24	(.88)
21. Media & Assessment Variety	14.57	10.89	(NA)

Note: Inter-item reliabilities are shown in parentheses.

Table 3 shows results of hierarchical regression analyses for each of the dependent variables. Incorporation of our measures for the seven principles significantly increased the amount of variance accounted for in each of the dependent variables, with increases ranging from twenty-four to forty-seven percent. The principles of encouraging contacts between students and faculty were supported by our findings. Student-faculty contact was moderately associated with perceived learning ($b=.10$, $p<.1$) and strongly associated with course satisfaction ($b=.19$, $p<.001$). As expected, perceived isolation was significantly negatively associated with all three dependent variables at least the $p<.01$ level. The principle of developing reciprocity and cooperation among students also was at least partially supported by our analysis. Collaboration was positively associated with perceived learning ($b=.11$, $p<.05$) and delivery medium satisfaction ($b=.16$, $p<.01$), but it was not a significant predictor of course satisfaction.

Non-exam evaluations were not a significant predictor of learning or either type of satisfaction; therefore, we did not find support for the principle of using active learning techniques. However, we did find support for the principles of giving prompt feedback and emphasizing time on task. Feedback was a significant predictor of perceived learning ($b=.25$, $p<.001$) and delivery medium

satisfaction (b=.36, p<.001), while student time spent on the course site (b=.00, p<.05) and perceived flexibility (b=.18, p<.001) were positively associated with perceived student learning. Perceived flexibility was also significantly associated with course satisfaction (b=.47, p<.001).

We found mixed support for the principle of communicating high expectations. High expectations was a significantly positive predictor of all three dependent variables, but the number of peer teaching opportunities in a course was a significant negative predictor of perceived learning (b=-.13, p<.1) and delivery medium satisfaction (b=-.19, p<.01). Finally, since media and assessment variety was only a significant predictor of perceived learning (b=.01, p<.05), we found only moderate support for the principle of respecting diverse talents and ways of learning.

Several control variables were significant predictors of course outcomes. Men were associated with higher perceived learning (b=-.36, p<.001) and delivery medium satisfaction (b=-.27, p<.01), whereas women were associated with course satisfaction (b=.16, p<.05). Prior web-based course experience for students was a negative predictor of perceived learning (b=-.05, p<.1) and delivery medium satisfaction (b=-.09, p<.001), but a positive predictor of course satisfaction (b=.04, p<.1). Conversely, instructor online course experience had the opposite effect for each of these variables.

TABLE 3: Results of Hierarchical Regression Analyses on Dependent Variables (n=334)

Variables	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Control Variables:						
Age	-.00	-.00	.01	.00	-.01	-.00
Gender	-.31**	-.36***	-.26*	-.27**	.15	.16*
Skill Level	.13*	.06	.02	-.02	.20	.11
Online Course Experience	.01	-.05+	-.07*	-.09***	.13***	.04+
Instructor Experience	.06**	.04*	.04***	.04*	.01	-.03+
Required Course	.11	.15	-.03	.02	.10	.09
Quantitative Course	.03	.12	-.02	-.00	-.21+	-.06
Class Section Size	.01	-.01	.02	-.00	.02*	.01

"Seven Principles" Variables	Perceived Student Learning	Satisfaction with Delivery Medium	Satisfaction with Course
1. Student-Faculty Contact	.10+	.08	.19***
Perceived Isolation	-.12*	-.15***	-.15***
2. Collaboration	.11*	.16***	.01
3. Non-exam Evaluations	-.00	-.05	-.00
4. Feedback	.25***	.36***	.05
5. Student Usage	.00**	.00	-.00
Perceived Flexibility	.18***	.08+	.47***
6. High Expectations	.22***	.11*	.11**
Peer Evaluations	-.13+	-.19**	.13*
7. Media & Assessment Variety	.01*	.01	-.00

F	4.64***	9.66***	4.63***	10.61***	6.67***	27.47***
Degrees of freedom	8,325	18,315	8,325	18,315	8,325	18,315
Adj. R-squared	0.08	0.32	0.08	0.34	0.12	0.59
Change in R-squared		0.24***		0.26***		0.47***

Note: Unstandardized regression coefficients reported.

+ p < .1 , *p < .05, **p < .01, ***p < .001

Discussion

Findings that greater participant contact and collaboration, an emphasis on feedback, and the effective use of learning time are associated with learning and satisfaction is consistent with previous findings of studies of web-based courses (DiBiase, 2004; Easton, 2003; Hiltz & Wellman, 1997). The lack of support for active learning and diverse learning styles also has some support in the distance education literature. Fornaciari and Matthews (2000) found that certain personality types tend to express preferences for and gravitate toward distance education, suggesting that the need to accommodate a variety of styles and approaches in a distance education context may not be as great as some have conceptualized. If future research supports this non-finding, then a substantial increase in instructor time to prepare and arrange for the

additional media may not be justified, allowing instructors to focus on the relational aspects of web-based courses (Brower, 2003; Coppola, Hiltz, & Rotter, 2002; Garrison et al., 2000).

The findings on the relationships between prior online course experience and course outcomes for both students and faculty were noteworthy. A possible explanation may be the applicability of prior knowledge to their experiences. The range of courses a faculty member is involved with online is much smaller than that of students. Also, instructors are likely to be involved with the same course or courses more than once. This experience provides faculty the opportunity to improve their experiences with developing and updating course content in addition to their interaction with both the students and the technology. Conversely, students have to deal with different content with every course offering. Therefore, the primary transferable knowledge they bring to subsequent online courses is their knowledge of the technology and interaction with others (Anderson, 2002; Arbaugh, 2004). Although beyond the scope of this study, the relationship between prior online course experience and course outcomes is certainly a needed topic for future research.

Several limitations make these findings tentative. The primary limitation is the development of the measures of the seven principles. Although the Flashlight inventory was based in part on the seven principles, the fact that only four principles could be derived from the factor analysis is disappointing. The measurement of the seven principles certainly can be refined further. Other limitations emerge from the nature of the sample. Because the sample was gathered from MBA programs that use online courses as a complement to their classroom-based courses, the findings may not be generalizable to MBA programs that are exclusively online. Also, since classroom-based courses were not part of the sample, it cannot be stated with certainty that the findings are unique to web-based learning environments.

In spite of these limitations, there are a number of potential implications of the study on the design and practice of web-based business education. First, the findings supporting the need for contact amongst students and faculty should be encouraging to faculty new to the online environment. These findings provide additional support for the idea that the interpersonal and behavioral aspects of conducting business courses online may be more important than

technological prowess for producing a positive learning environment (Arbaugh, 2005; Brower, 2003). Therefore, instructors new to web-based courses may want to focus initially on generating and maintaining class discussion and developing reasonable expectations for responsiveness, realizing that they can further develop their skill level with the technology in future course offerings.

These findings also should be good news to those responsible for training faculty to teach online because the findings suggest that many characteristics of effective classroom undergraduate teaching appear to be somewhat generalizable to online MBA instruction. This suggests that trainers could use classroom best practices as a starting point for designing programs for effective online teaching, particularly in the areas of generating interaction with students and providing regular feedback on their performance.

A third potential implication concerns the communication of high expectations in web-based courses. The communication of expectations has not been addressed widely in previous web-based course research. The findings of this study suggest that initial concerns about web-based education being an inferior delivery mechanism may be unfounded. Therefore, instructors should not consider relaxing expectations of students merely because of the relative novelty of this delivery medium (Gibson & Gibson, 1995).

Conclusion

This study examined the applicability of Chickering and Gamson's Seven Principles of Effective Undergraduate Instruction to graduate-level web-based courses. While most of Chickering and Gamson's seven principles received at least partial support, the evidence was not convincing enough to merit designation of the seven principles as a silver bullet for comprehensive design and conduct of web-based courses. However, there was enough support to suggest that as further refinements of the measures of the seven principles are developed, they could be used as a framework for developing theories of web-based education.

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